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# Sociology of Curriculum : the Role of School Textbooks in Nation-Building

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*In this study, an attempt has been made to examine the relevance of school textbooks to the process of nation building in the light of some of the Constitutional values. The author has done a comparative study of prescribed textbooks. The study highlights the extent to which constitutional values are incorporated into the textbooks as necessary condition to accelerate the level of political awareness and responsiveness which are some of the features of a modern polity.*

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SOCIOLOGY OF CURRICULUM is a relatively new aspect of sociology of education where social scientists are concerned with the societal effects upon the curriculum (Morrish 1972 : 257). In the process of modernization, society tries to recast education in order to make it functionally contributive and cooperative in the efforts of the society to achieve its new objectives (Shah 1974 : 3). After the formulation of the national objectives as enshrined in our Constitution, the nation committed itself to increase the productivity and industrialization, based on modern science and technology, to develop human potentialities and efficient technical know-how, to establish socialistic pattern of economy and economic self-sufficiency, to accelerate the process of a socio-cultural renaissance and promote democratic principles (Hardgrave 1970 : 44-49; Adams 1970 : 78; Education Commission 1964-66 : 25; Commem 1963 : 15; Naik 1965 : 73-115; Shah

1971 : 241). These are some of the core dimensions of nation-building which have impinged upon the system of education to work in accordance with them in modernizing the society.

Education has been viewed as important source of modernization (Gore, 1971 : 233). Here we are concerned to examine its role in terms of democratic principles which we have stated as one of the dimensions of nation-building. Social scientists have realized the importance of this political context of education (Almond and Verba 1963 : 318; Anderson 1966 : 68; Massialas 1969 : 9-16; Rudolph and Rudolph 1972 : 5-8). They point out that education possesses the keys to promote democratic values through deliberate incorporation into its instructional processes. It is through this incorporation of values and their communication that the younger generation is politicized in a desired political order. This function of education is important because students have to be politically informed, so that, they can critically evaluate the functioning of the system of polity which gives an input support to the system.

Their political knowledge of democratic values will not only raise the level of their political awareness but also make them politically responsive and efficacious which are some of the features of a modern polity. In this context, the textbook which is a part of educational process and an important means of communication and learning, can play a role by incorporating democratic values into its content and communicating them to students.<sup>1</sup> In this paper, we are concerned with the extent to which these values (as stated later) are incorporated into the textbooks. We assume that their systematic incorporation will help in accelerating the level of democratic awareness and responsiveness of students which will strengthen the process of nation-building in a democratic context. Therefore, we have tried to examine, how far systematic efforts have been made and what relationship exists between some of the important democratic values and the political content of school textbooks. In order to examine this relationship, we have raised the following major issues.

1. Is there any systematic or consistent effort made to incorporate democratic values into the textbooks ?
2. Is there any correlation between the age of students and the nature of values internalized ?
3. Is there any consistency or discrepancy in class-wise as well as subject-wise emphasis on political values ?

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<sup>1</sup> There are also other agencies such as the family, the teacher, the peer group, the mass-media, etc. which can play significant role in politicizing the students in terms of democratic values. The textbook is one of them. In order to study its role in this context, see, for instance, *The Report of the First Meeting of the National Board of School Textbooks*, NCERT, April 5-6, 1969, p. 43 and May 3, 1970, pp. 15-16.



While analysing the content of school textbooks, we have taken into account the following democratic values as enshrined in our Constitution .

1. Citizenship, 2. A Sense of Belonging to the Nation, 3. Fraternity, 4. Equality of Opportunity, 5. Political Participation, 6. Secularism, 7. Distributive Justice, 8. Individual Liberty, 9 Protection of Minority Rights.

1. *Citizenship.* The concept of citizenship can be measured in terms of desirable human quality which can give the Indian Union the strength of a unitary state. The chief elements of the content of good citizenship are (i) acquisition of knowledge about political values and public issues, (ii) obedience of public law and policy, (iii) loyalty to the nation and responsibility towards public property, (iv) effective participation and cooperation in public affairs as citizens, and (v) respect to equal rights and opportunity for all citizens (*The Encyclopaedia of Education* 1972 : 135-137; Massialas 1960 : 124-140). These are considered as basic aims of the teaching of citizenship necessary for the sustenance and well-being of the nation.

2. *A Sense of Belonging to the Nation.* A sense of belonging to the nation can be operationalized in terms of a situation in which a feeling of unity, oneness and identification of oneself with national aspirations prevail in diversity and multi-nationality (Khan 1970 : 20-25, Massialas 1969 : 12). These are basic political norms which are expected to be promoted through school textbooks and formal classroom rituals.

3. *Fraternity.* Fraternity as a political value can be measured in terms of a feeling of brotherhood irrespective of caste and creed. The inculcation of this value will enable individuals to develop fellow-feelings and cooperation, helpful in maintaining the unity of the nation as a whole.

4. *Equality of Opportunity.* The notion of equality is a relatively recent political value which breaks down the barriers between various groups and categories. On 13 August 1947, Jawaharlal Nehru said: "The Government of India will treat every Indian on an equal basis, and try to secure for him all the rights which he shares with others. Our state is not a communal state, but a democratic state in which every citizen has equal rights. The Government is determined to protect these rights, in legal, socio-economic and political fields" (*India Since Independence* 1971 : 10).

The ideal of the equality of opportunity can be measured in the following operative terms : (i) equal treatment of every citizen before law in matters of reward and punishment, (ii) prohibition of discrimination on the basis of caste, class, sex and religion, (iii) equality of opportunity in matters of education and public employment, (iv) abolition of untouchability or purity-pollution, and (v) abolition of title (*The Constitution of India* 1969 : 8, Basu 1965 : 287-540).

The main point underlying the concept of equality of opportunity is the impartial and rational treatment of all citizens in legal and socio-economic matters and the allocation of values to all sections of the society in accordance with their ability and needs. In order to secure this ideal for the maximum benefit and upliftment of deprived and weaker sections of our population, it has been institutionalized by legislations. However, the inherited natural inequalities are beyond the reach of legislations.

The main value to be inculcated in the children through the school textbooks is that they must know that there should be an impartial treatment of all citizens of India before law, prohibition of discrimination on the basis of caste, class, sex and religion, equal opportunity in matters of education and public employment; abolition of untouchability and the respect for the rights of others.

5. *Political Participation.* Political participation is a necessary condition for an effective democratic system. It refers to voting right, participation and membership in voluntary associations such as students' union, teachers' associations, trade union, etc. The membership in such structures gives an input support to the polity when collective demands are made. We are concerned mainly with the elements of freedom to exercise their voting right in a useful manner and the development of the awareness of this right along with their duties and responsibilities as citizens.

6. *Secularism.* Secularism is also a modern political value. It refers to religious tolerance and rejection of any religious element in social or political policy matters. A secular policy may not be anti-religious or irreligious but it is certainly a policy which is non-religious. However, secularism embodies the idea of rationalism as a guide to action (Gore 1971: 236-237). It can be measured in terms of (i) religious tolerance and equal reverence for all religions, (ii) rejection of religious elements in policy matters, (iii) freedom to exercise a chosen form of religious beliefs, (iv) freedom to manage religious affairs, and (v) freedom to propagate religious views. The concept of secularism also involves that religious activities which are dangerous to public morals, safety, health or good order have to be suppressed through legislations.

7. *Distributive Justice.* J. S. Mills defines the good of a given society as the greatest good of the greatest number. Similarly, distributive justice in operational terms refers to (i) equal distribution of national wealth to each citizen according to his need and work done, so as to benefit the largest number of people in a given society, and (ii) prevention of a situation in which a few live at the expense of many in a society. For this purpose, distributive justice implies the adoption of certain conscious course by the leaders of the society, through governmental action or public initiative.

8. *Individual Liberty.* Individual Liberty may be defined as the state of affairs in which the individuals can freely exercise their rights without undue interference from the state. These rights are: (i) political (right to vote, etc.), (ii) economic (right to take up any work available in the society), and (iii) social (liberty of thoughts, expression, belief and worship, education and other related freedom). The concept of individual liberty also implies that there should be no involvement in anti-social and anti-democratic activities.

9. *Protection of Minority Rights.* The concept of minority rights refers to cultural rights of religious minorities or backward groups in India. Operationally, the minority rights can be defined in terms of the protection of their cultural rights. These cultural rights are: (i) any section of citizens belonging to different culture have right to conserve their culture, (ii) no citizen of India will be deprived of getting admission to any educational institutions on the basis of caste, class, sex, religion and language, (iii) all minorities irrespective of their cultural base have right to establish and administer educational institutions of their choice, (iv) government in granting aid to any educational institution will not discriminate against or impose any restriction on the ground that it is under the management of minority (*The Constitution of India* 1969 : 17). The understanding of these values will enable the children to develop a sense of respect towards minority rights.

The modernization of Indian system of polity depends on the extent to which these major constitutional values, which form the ideological basis of our political system, are achieved. If these values are properly incorporated into the textbooks, school children may be able to acquire basic orientations to the core political values and may realise the importance of these values in the life of the nation.

#### METHODOLOGY

In the light of the values discussed above, content analysis, which is a technique of 'analysing the raw data available in a document, has been done. First, for the purpose of minimizing subjectivity, the political contents of the textbooks have been analysed and ratings have been given by a panel of three judges including the author. In a particular passage of a textbook, there may be conflicting themes but the judges were asked to give scores to only the political content of the themes relevant to the values of political modernization listed above. It is in this sense that the study is limited to a specific aspect of the textbooks, but it is, at the same time, more time-saving and relevant to our problem. Secondly, only positive aspect of the political content has been taken into account. Negative scoring on the basis of the content which might not conform to the values could also have been done but such elements

are found to be very few. Thirdly, only class-wise ratings have been given from Class I to Class IV because subjects are not very discrete at this stage while subject-wise ratings have been given from Class VI to XI because of the discreteness of subjects. Fourthly, all operative norms within a political value may not be reflected in the textbook but if any one of the elements is reflected, its score has been given. Therefore, there may be variation in scores within a value. However, the broad idea about the political values specified, has been taken into account while making ratings. Fifthly, the values of political modernization may not be mutually exclusive. They may overlap and, therefore, may create measurement problem. The dominant element in the value, however, has been considered. Sixthly, after the ratings had been done, an average was taken and figures rounded off in order to show clear variations in scores secured by the political values and to understand the strength of the thematic representation in the textbooks in terms of aggregate scores. We have analysed prescribed textbooks in Hindi, English, History and Civics in government schools in Delhi and those textbooks which are commonly being used in public schools in the same subjects.

#### INTERPRETATION OF DATA

*The Content of School Textbooks : Their Relevance to Constitutional Values.* The following table shows the total score secured by each Constitutional value in various classes in both government as well as public school textbooks.

Table 1  
TOTAL SCORES SECURED BY CONSTITUTIONAL VALUES

S. No.	Political Values	Total Scores Secured by Each Political Value in Government and Public Schools Textbooks From I—XI				
		Govt. schools		Public schools		Govt.-Public school % difference
		scores	%	scores	%	
1.	Citizenship	125	25.77	83	40.69	-14.92
2.	A Sense of Belonging to the Nation	37	17.90	40	19.61	- 1.71
3.	Fraternity	54	11.10	16	7.84	+ 3.26
4.	Equality of Opportunity	51	10.50	15	7.35	+ 3.15
5.	Political participation	44	9.27	8	3.92	+ 5.85
6.	Secularism	41	8.40	13	6.38	+ 2.02
7.	Distributive Justice	39	8.00	16	7.84	+ 0.16
8.	Individual Liberty	30	6.18	9	4.41	+ 1.77
9.	Protection of Minority Rights	14	2.88	4	1.96	+ 0.92
10.	Grand Total	485	100.00	204	100.00	

In government school textbooks the value "citizenship" secures a total score of 125 (25.77%) and other values much less. For instance, the values "individual liberty" and "protection of minority rights" secure a total score of only 30 (6.18%) and 14 (2.88%), respectively. There is a ratio of about 1:4 and 1:9 between the eighth and the first and the last and the first value. Even in public school textbooks the value "citizenship" secures a total score of 82 (40.69%) while other values have not been given any significant weightage. For example, the same values, "individual liberty" and "protection of minority rights" secure a score of only 9 (4.41%) and 4 (1.96%), respectively. There is a ratio of about 1:9 and 1:21 between the eighth and the first, and the last and the first value. The column 5th of Table-I shows differences in emphasis given to various values in both the school textbooks. In public school textbooks, the first two political values secure 14.92% and 1.71% more

**Table 2**  
**TOTAL SCORES SECURED BY CONSTITUTIONAL VALUES**

<i>Class</i> <i>Total Scores Secured by All Political Values in Government and Public Schools Textbooks in Each Class</i>					
	<i>Government School</i>		<i>Public School</i>		<i>Govt.-Public school % difference</i>
	<i>scores</i>	<i>%</i>	<i>scores</i>	<i>%</i>	
I	9	1.90	1	0.49	+1.41
II	25	5.15	17	8.33	-3.18
III	17	3.50	13	6.38	-2.88
IV	37	7.62	15	7.35	-0.27
V	13	2.68	8	3.93	-1.25
VI	76	15.67	14	6.86	+8.81
VII	52	10.72	41	20.10	-9.38
VIII	51	10.51	41	20.10	-9.59
IX	76	15.67	49	24.01	-8.94
X	66	13.60	2	0.98	+12.62
XI	63	12.98	3	1.47	+11.51
Total	485	100.00	204	100.00	

scores than they secure in government school textbooks, while other values have comparatively been given much emphasis in government school textbooks. For example, the values "fraternity", "political participation" and "secularism" secure 3.26%, 5.35% and 2.02% more scores in government school textbooks than they secure in public school textbooks.

Table 2 shows the total score secured by various constitutional values in each class in both government school as well as, public school textbooks. In Classes V, VI and XI in column 2, the total score of all the values is 13 (2.68%), 76 (15.67%) and 63 (12.98%), respectively. The significant point to mention here is that there is a ratio of about 1:6 between Classes V and VI while this level of variation should be much less and gradual because the books prescribed in these classes are not much differentiated in terms of value-load. Contrary to this, there is a ratio of about 1:5 between Classes V and XI where much variation is expected because course at these levels are much differentiated and the students in higher classes are rather mentally mature to digest the deeper meanings of the values<sup>2</sup>. Such discrepancies we find also in public school textbooks. For instance in Class IX in Column 3, political values secure a total score of 49 (24.01%) while in Classes X and XI, it is only 2 (0.98%) and 3 (1.47%) respectively, with a ratio of about 1:16 between XI and IX and 1:25 between X and IX. The fourth column of this table shows differences in emphasis given to these values in the textbooks prescribed for various classes in both the schools. However, both these tables show (1 and 2) that in the incorporation of constitutional values in the textbooks, there is neither any pattern nor consistency in the emphasis given to the values.

These tables are further extended for details. After giving some examples of the observations of political content of the textbooks, class-wise and subject-wise variations in scores will be examined. The purpose of giving examples here is to illustrate and clarify what aspect of the content has been taken into account. For example, an NCERT book entitled *Social Studies : Our Country India* for Class IV, deals with various political values relevant to the Constitutional values. This book explains to children that "Our Country is a big country. Our people speak different languages. They have different faith and customs. But all are Indians. We have one Constitution, one National Flag, one

<sup>2</sup> Social scientists have proved that in early age young children first cognize subjects with an undifferentiated, unstructured good-bad dimension. A child's comprehension of democratic values improves with age and the structuring of these values comes later on. Incorporation of our constitutional values into the textbooks is just contrary to this finding. See, Piaget (1965 : 135); Weinstein (1957 : 166-75); Merelman 1970 : 62; Greenstein (1968 : 6).

National Anthem and one National Emblem. These are symbols of our National Unity" (p.77). The theme of this passage conveys that we all belong to one nation. But at the same time, it alludes to cultural diversity within an overarching national unity. However, the passage arouses a spirit of oneness relevant to the value "fraternity" and "a sense of belonging to the nation". Another book entitled *Civics—Social Science Series*, published by the Cambridge Publishing House and prescribed in public schools for Class VIII, also deals with various political values. It explains that "all of us are Indians even though we may follow different religions, adopt diverse customs and speak different languages. We still strive and preserve our national unity. Only then we can make our country grow strong and rich" (p.22). This passage also conveys to students the concept of unity in diversity for building a strong nation. Another NCERT book entitled *Ancient India*, for Class VI in government schools, deals with some socio-political values. For instance, it explains that "Ashoka wanted all the religious groups to live together in peace and tolerance. He wanted people to be friendly towards one another. The younger people should obey the older ones, and children should obey their parents. He wanted the people should live in peace, not fight over land and religions. The important thing was not the differences but the unity within the Empire" (p.75). The values conveyed through this passage may promote secular attitude, citizenship and a sense of unity, but it may also inhibit the questioning mentality of children. The injection of values through this passage may also conflict with "individual liberty", "equality of opportunity" and "political participation". Another book entitled *An Outline of World Civilization*, for Classes IX, X and XI, published by Arya Book Depot and prescribed in government schools also hold the view that "all men are created equal and that they are endowed by their creator with certain inalienable rights, that among these are life, liberty and pursuit of happiness." This passage familiarizes the students with the value of the liberty of thought, expression, belief and worship but it may create wrong impression on their mind that all are created equal. It ignores the value of natural inequality and the impartial and rationalistic treatment of all men and women in society. However, it may enable the students to feel that they are free to live, avail themselves of opportunity and exercise their rights in a constructive manner. Similarly, another book entitled *A Textbook of Civics and Indian Administration*, published by the Orient Longmans and prescribed for Class IX in public school, deals with various aspects of Indian political culture. For instance, it deals with the Fundamental Rights, Welfare State, Secular State, Qualities of a Good Citizen, Political Rights, Common Good, Democracy and Dictatorship, Party System in Government, Function of International Bodies like UNO, etc. Such values incorporated

into the textbooks will certainly help in developing political awareness, as well as, consciousness, among students. But the problem here is that no conscious and consistent effort seems to have been made in incorporating such values into the textbooks both in government and public school textbooks.

Table 3  
DISTRIBUTION OF SCORES (GOVERNMENT SCHOOLS)

<i>Political Values</i>	<i>Class-wise Distribution of Scores Secured by Constitutional Values</i>											<i>Total</i>
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>	<i>VII</i>	<i>VIII</i>	<i>IX</i>	<i>X</i>	<i>XI</i>	
1. Citizenship	4	8	7	8	3	22	19	17	14	12	11	125
2. A Sense of Belonging to the Nation	0	0	7	10	4	16	12	18	7	5	8	87
3. Fraternity	3	6	1	5	0	8	6	6	8	5	6	54
4. Equality of Opportunity	1	3	0	5	3	6	2	4	7	10	10	51
5. Political Participation	0	0	1	2	0	10	4	4	8	6	9	44
6. Secularism	1	3	1	2	0	9	4	0	9	8	5	41
7. Distributive Justice	1	4	0	2	3	0	2	0	10	9	8	39
8. Individual Liberty	0	1	0	3	0	2	2	2	7	8	5	30
9. Protection of Minority Rights	0	1	0	0	0	3	1	0	6	3	1	14
Total	9	25	11	37	13	76	52	51	76	66	63	485

Table 3 (A)  
DISTRIBUTION OF SCORES (PUBLIC SCHOOLS)

<i>Political Values</i>	<i>Class-wise Distribution of Scores Secured by Constitutional Values</i>											<i>Total</i>
	<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>	<i>VII</i>	<i>VIII</i>	<i>IX</i>	<i>X</i>	<i>XI</i>	
1. Citizenship	1	4	7	7	2	11	18	16	17	0	0	83
2. A Sense of Belonging to the Nation	1	1	3	7	1	3	9	10	4	1	1	40
3. Fraternity	0	5	1	1	0	0	1	5	3	0	0	16
4. Equality of Opportunity	0	2	0	0	2	0	3	2	6	6	0	15
5. Political Participation	0	0	0	0	0	0	1	3	3	0	1	8
6. Secularism	0	1	2	0	0	0	4	3	2	1	0	13
7. Distributive Justice	0	3	0	0	3	0	2	1	6	0	1	16
8. Individual Liberty	0	1	0	0	0	0	2	1	5	0	0	9
9. Protection of Minority Rights	0	0	0	0	0	0	1	1	2	0	0	4
Total	1	17	13	15	8	14	41	41	49	2	3	204

Tables, 3 and 3 (A) show class-wise distribution of scores secured by various constitutional values. For example, in government school text-books the value "citizenship" secures a score of 3, 22 and 11 in



Classes V, VI and XI, respectively and the ratio between Classes V and VI is about 1:7 and it is 2:1 between Classes VI and XI. Such inconsistency we find also in the score secured by the value "a sense of belonging to the nation". It secures 16 in Class VI while it is only 5 in Class X with a ratio of about 3.1. By way of further illustration, the value "political participation" secures a score of 10 in Class VI while in other classes it has not been much emphasized. So is the case with "secularism", "distributive justice", "individual liberty" and "protection of minority rights". Such inconsistency we also find in public school textbooks. For example, the value "citizenship" secures a value of 18 and 17 in

Table 4  
DISTRIBUTION OF SCORES (GOVERNMENT SCHOOLS)

<i>Political Values</i>		<i>VI</i>					<i>VII</i>				
		<i>Hin</i>	<i>Eng.</i>	<i>Hls.</i>	<i>Civ.</i>	<i>T.</i>	<i>Hin.</i>	<i>Eng.</i>	<i>Hls.</i>	<i>Civ.</i>	<i>T.</i>
1	Citizenship	13	1	1	7	22	8	1	0	10	19
2.	A Sense of Belonging the Nation	10	5	0	1	16	8	2		11	12
3.	Fraternity	2	2	1	3	8	4	1	0	1	6
4.	Equality of Opportunity	4	0	1	1	6	0	1	0	8	2
5.	Political participation	4	1	2	3	10	3	0	0	1	4
6.	Secularism	3	1	5	0	9	1	0	2	1	4
7.	Distributive Justice	0	0	0	0	0	0	0	0	2	2
8.	Individual Lilerly	0	0	2	2	0	0	0	2	0	2
9.	Protection of Minority Rights	1	1	0	1	3	0	0	0	1	1
	Total	37	11	10	18	76	24	5	3	20	52

Table 4 (contd.)

<i>VIII</i>						<i>IX</i>					<i>X</i>					<i>XI</i>				
<i>Hin.</i>	<i>Eng.</i>	<i>Hls.</i>	<i>Civ.</i>	<i>T.</i>		<i>Hin.</i>	<i>Eng.</i>	<i>Hls.</i>	<i>Civ.</i>	<i>T.</i>	<i>Hin.</i>	<i>Eng.</i>	<i>Hls.</i>	<i>Civ.</i>	<i>T.</i>	<i>Hin.</i>	<i>Eng.</i>	<i>Hls.</i>	<i>Civ.</i>	<i>T.</i>
1.	8	4	0	5	17	—	—	5	9	14	—	—	0	12	12	—	—	4	7	11
2.	10	1	5	2	18	—	—	2	5	7	—	—	1	4	5	—	—	3	5	8
3.	2	1	2	1	6	—	—	4	4	8	—	—	4	1	5	—	—	3	3	6
4.	0	1	2	1	4	—	—	2	5	7	—	—	4	6	10	—	—	7	3	10
5.	1	0	2	1	4	—	—	3	5	8	—	—	3	3	6	—	—	5	4	9
6.	0	0	0	0	0	—	—	5	4	9	—	—	5	3	8	—	—	4	1	5
7.	0	0	0	0	0	—	—	6	4	10	—	—	4	5	9	—	—	6	2	8
8.	1	0	0	1	2	—	—	4	3	7	—	—	5	3	8	—	—	3	2	5
9.	0	0	0	0	0	—	—	3	3	6	—	—	1	2	3	—	—	0	1	1
Total	22	7	11	11	51	—	—	34	42	76	—	—	27	39	66	—	—	35	28	63

Classes VII and IX, respectively, while no emphasis has been given in Classes X and XI. - All constitutional values have been given more emphasis in Classes VII, VIII and IX in the public school textbooks, while in other classes, they have been insignificantly emphasized and in some classes they receive no emphasis. For example, in Classes IV and VI, as well as, X and XI, the values "equality of opportunity", "political participation", "secularism", "distributive justice", "individual liberty" and "protection of minority rights", have not been emphasized at all.

If we compare, we find that political values in government school textbooks have been comparatively emphasized more than in public school textbooks. For example, the ratio between the scores secured by the value "citizenship" in Classes VI, X and XI in government school textbooks and the score secured by the same value in the same classes in public school textbooks is 2:1, 12:0 and 11:0, respectively. Similarly, the ratio between the scores secured by the value "equality of opportunity" in the same classes in the textbooks of both the schools is 6:0, 10:0 and 10:0 respectively. The same is the case with "secularism", "distributive justice", "individual liberty" and "protection of minority rights".

Now let us briefly illustrate subject-wise horizontal and vertical consistency or discrepancy in the distribution of scores. Table 4 shows that language books for lower classes may be more useful for inculcating political values in students, but the books for Classes IX, X and XI are written entirely from the literary point of view. There is, therefore, no direct emphasis on constitutional values. Horizontal subject-wise distribution as shown in the table, does not show any systematic effort. For instance, the value "citizenship" secures a score of 13 in Hindi in Class VI while it secures only 8 in Classes VII and XI in Civics. The values "equality of opportunity", "distributive justice" and "secularism" have insignificantly been emphasized in almost all the subjects. The courses in history for Classes IX to XI cannot be less meaningful for political teaching than civics courses. For example, the value "equality of opportunity" secures a score of 7 in history while it is only 3 in civics in Class XI.

Vertical distribution of scores within a particular subject also shows a considerable discrepancy and disproportion. For instance, in Hindi in Class VI, there is a ratio of 13:1 and 6:1 between the first and the last values and, the first and the third values, respectively. In civics courses for Class VII, there is ratio of 10:1 between the first and the second, third, fourth, fifth, sixth, and the last values. Similarly, in civics courses for Class X, the ratio between the first and the third values is 12:1 and between the first and the last values is 6:1. Such uneven distribution of scores within a subject, can also be observed in other classes, which shows

lack of conscious effort in incorporating constitutional values in government school textbooks. Some unsystematic effort has also been made in incorporating these values in public school textbooks also. Table 4 (A) shows that language books are not very relevant for inculcating political values and in higher classes prescribed language textbooks are entirely written from the literary point of view. Civics course for Classes VII, VIII and IX are relevant for political teaching and almost all constitutional values have been incorporated. But they have been

Table 4 (A)  
DISTRIBUTION OF SCORES (PUBLIC SCHOOLS)

Political Values	Subject-wise Distribution of Scores Secured by Constitutional Values in Each Class									
	VI					VII				
	Hin.	Eng.	His.	Civ.	T.	Hin.	Eng.	His.	Civ.	T.
1. Citizenship	2	1	2	6	11	0	0	0	18	18
2. A Sense of Belonging to the Nation	1	1	0	1	3	3	1	0	5	9
3. Fraternity	0	0	0	0	0	0	0	0	1	1
4. Equality of Opportunity	0	0	0	0	0	1	0	0	2	3
5. Political Participation	0	0	0	0	0	0	0	0	1	1
6. Secularism	0	0	0	0	0	0	0	2	2	4
7. Distributive Justice	0	0	0	0	0	0	0	0	2	2
8. Individual Liberty	0	0	0	0	0	0	0	0	2	2
9. Protection of Minority Rights	0	0	0	0	0	0	0	0	1	1
Total	3	2	2	7	14	4	1	2	34	41

Table 4 (A) (Contd.)

	VIII					IX					X					XI				
	Hin.	Eng.	His.	Civ.	T.	Hin.	Eng.	His.	Civ.	T.	Hin.	Eng.	His.	Civ.	T.	Hin.	Eng.	His.	Civ.	T.
1.	1	0	0	15	16	—	—	0	17	17	—	—	0	0	0	—	—	0	0	0
2.	5	1	2	2	10	—	—	1	3	4	—	—	1	0	1	—	—	1	0	1
3.	1	0	1	3	5	—	—	0	3	3	—	—	0	0	0	—	—	0	0	0
4.	0	0	0	2	2	—	—	3	3	6	—	—	0	0	0	—	—	0	0	0
5.	0	0	2	1	3	—	—	0	3	3	—	—	0	0	0	—	—	1	0	1
6.	0	0	0	2	2	—	—	0	3	3	—	—	1	0	1	—	—	0	0	0
7.	0	0	0	1	1	—	—	0	6	6	—	—	0	0	0	—	—	1	0	1
8.	0	0	0	1	1	—	—	0	5	5	—	—	0	0	0	—	—	0	0	0
9.	0	0	0	1	1	—	—	0	2	2	—	—	0	0	0	—	—	0	0	0
Total	7	1	5	28	41	—	—	4	45	49	—	—	2	0	2	—	—	3	0	3

ignored in other classes because the public school textbooks seem to have been written with a view to train student to command foreign language and acquire foreign culture. Therefore, these textbooks are highly English-oriented. There is considerable discrepancy and disproportion in subject-wise emphasis on various political values. In Class VI, "citizenship" secures a value of 6 in civics courses while other values in the same subject and in the same class have been ignored. Similarly in Class VII in civics course, "citizenship" secures a score of 18 while "secularism" and "a sense of belonging to the nation" secure only 2 scores, with a ratio of 9:1 between the first and later two values. If we compare, we find that the public school textbooks prescribed for civics courses are far better than those prescribed in government school. For example in Classes VII, VIII and IX in Civics courses, the value "citizenship" secures 18, 15, 17, respectively. In government school textbooks, the same value in the same classes and in the same course secures only 10, 5 and 9 scores. There is a ratio of about 2:1, 3:1 and 2:1 respectively. But other values have been emphasized in government school textbooks while they are ignored in the public school textbooks. For instance, the value "equality of opportunity" secures a score of 4 in history in Class X in government school while it is 0 in the same subject and in the same class in public school textbooks. Similarly, there is a ratio of 6:0 in the scores secured by the same value in the same class in civics courses in government and public school textbooks. Such uneven and unsystematic distribution of scores shows that neither there is any consistent effort made in incorporating constitutional values into the textbooks, nor there is any correlation between the age of students and the nature of values internalized (Merelman, 1970:59). Even there is no consistency in class-wise and subject-wise emphasis on various constitutional values.

Keeping in view the above discussion, we can conclude that there is neither any systematic and consistent effort made to incorporate our constitutional values into the textbooks nor there is any correlation between the age of students and the nature of values internalized. The books prescribed in government and public schools in Delhi from classes I to XI have to be made more relevant to the values enshrined in our Constitution, so that, they can contribute to the process of nation-building by raising the level of political awareness and responsiveness of students. However, it is not suggested that the presence of our democratic values in the textbooks will be a sufficient condition to make students politically informed and responsive but it is certainly a necessary condition to accelerate the level of politicization of students.

Negative aspects which might prejudice the mind of the children and promote in them negative attitudes have to be identified for modification.

Though such instances are quite few, yet if ignored, they would weaken the fabric of the nation and defeat the very purpose for which these values are introduced. (*The Hindustan Times*, 14 September 1972; Chakravarty 1973; 34-44). A comparative study of the school textbooks in various States may be done in order to see the political impact on the course contents. The passages which conform or do not conform to our national values or the passages which are likely to inculcate in students negative attitudes, can be identified. It will help in re-orienting and reconstructing the courses in social sciences in accordance with our constitutional values. Field-oriented researches should be done in curriculum in order to produce better textbooks relevant for all the stages of education and suited to the age and mental maturity of students. Education has to contribute to the process of nation-building but it cannot perform its role properly unless reorientation and curricular replanning, at all stages, is given a major consideration in educational planning.

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# Research in Teacher Education Trends and Proposals

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*The present research paper deals with the current problems of teacher education. With the changing educational system and the introduction of the new 10+2+3 scheme, some new problems have arisen in the field of teacher education. Some of these have been taken up by eminent educationists for researches, but most of them are either untouched or very little work has been done to resolve them.*

*This paper is an attempt to suggest some current and important research topics for further researches in the field. Two other relevant works in this field, viz. The Third Year Book of Education (NOERT) and A Survey of Research in Education have also been consulted for providing information on the contemporary trends.*

*Apart from suggesting these research topics, the need for the use of suitable research methods for the study of different problems has also been emphasized.*

*At the end of the paper a chart, describing different dimensions of teacher behaviour and his/her imagined or actual role performance, has also been given, which will certainly help the researchers in the selection of suitable and important topics for research. A select bibliography will help the persons working in the field of teacher education in their quest.*

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TEACHER EDUCATION is an important sector of the total educational provisions. Barring a few, most educators and education-leadership come

from the rank and file of trained, educated teachers. Doubts about both the efficacy and adequacy of the teacher education programmes have been voiced; but unfortunately there is nothing new either in the content of objections or the grounds of reproach. Perhaps teacher education, as an activity and programme, shall have to live with the heretics and, to some extent, with the well-meaning cynics. Be that as it may, we find that with the tremendous increase in the quantum of educational research, this area has received some attention. The predictable can be stated. Teacher education would get to be examined from all point of view during the coming decade.

The spurt in research in general and Ph.D. in particular is due to several factors. Two of these are now well known : (a) the ugc would soon refuse to grant increments to the non-Ph D. teachers, (b) the employment market demands that more specialized personnel should be offered jobs at all levels. Besides purely personal reasons, this increase is not likely to ebb for quite some time. This obviously means that there is an urgent need to come out with proper plans for research in each of the major areas defining the parameters of each discipline. If the efforts can be coordinated at the initial stage, it would be both easy to give these a purposeful direction. If for nothing else, our present attempt has been motivated by this single goal.

We have suggested new areas to the prospective research scholars in the field of teacher education. These areas are new and have not been studied. In the second part of the paper we have given the areas that have been studied. If one compared these two areas, one would notice a complete absence of any repetition. We could have presented the researched areas first, but in order to avoid confusion we have taken up the new areas first.

I. *Possible New Areas.* (a) Teacher education, as a discipline, is offered at all levels in India. We prepare teachers for Nursery, Kindergarten, Primary, Middle and Secondary levels. There is a move to give some kind of orientation, pedagogy and teaching skills to even the university teachers. For certain technical and purely administrative and organizational reasons it might take quite some time before this move is universally accepted. At all these levels, there are institutional and local variations. Each State Government and University Department has its own perception of this move and its need. But the variations can be due to several other factors as well; for example, reasons of finance competence and imagination of the educational administrators, etc. Even at this point alone, several research areas can be identified. We would, however, come back to this later.

(b) After several commissions and committees have pointed out that educated youth become teachers for diverse reasons, including the one of



their being educationally poor, this area can be empirically examined from several points of view. Firstly, the grade structures have undergone considerable changes. Secondly, there are few more openings within this system than elsewhere (*sic.*). Thirdly, as more women are entering the school system at all levels, the problems are gradually changing their texture and context.

(c) Teacher education being a part of the total system reflects the ideology and value-orientation of the total community. Just as in every walk of life, here also we find, on any given scale, value variations, ranging from high motivation to complete indifference towards assignments and work. We should be able to correlate these with the motives underlying each variation among the teachers and teacher educators. Similarly, on another scale we can relate the personal and political philosophies to efficiency. This, however, is something that could be true for several other areas as well, but its importance cannot be denied for the teacher education programme as such. Particularly when we notice that in India several programmes for their results are entirely or partially teacher-dependent such as family planning, small saving, etc. If this is true then various roles of the teachers can be examined and his efficiency vis-a-vis teaching could be computed.

(d) There is one sensitive area which also lends itself admirably to further research. Due to historical and sociological reasons, every sector of Indian society did not take to education. We find that there are learning traditions in certain caste groups which run chronologically like a fine gossamer down the centuries. Others, if they were not exactly hostile to the advantages of education, could not see the benefits that accrue to them from education. Consequently there is as yet a caste dominance in teaching faculties. At all levels and area-wise there are very few variations. We suggest that from several points of view researches could be conducted in this area. The possibility is that in the procedures for admission and selection for the teacher education institutions some changes are necessary. In fact, numerous policy decisions may have to be taken after this area has been thoroughly explored.

(e) In the context of 10+2 pattern, there is a general feeling that teachers in different work-experience groups may have to be trained. We have already TTIS and polytechnics. The qualifications of teachers in these institutions vary a good deal and when teachers with this background are appointed, there are problems of equating different categories of teachers and fitting them into one or more scales of pay. What appears to have been ignored completely is the competence of such teachers. It is not merely whether or not a person is adequately trained, but the information levels of the individual teachers should not vary sharply. How does one ensure all this is a matter of considerable research.

(f) In a fast changing world a uniform programme of teacher-education would not be adequate or even necessary. Ranging from innovations in selection procedures to the final course offerings there are stages of development and encouragement. What precisely needs innovation is itself a point of research in addition to the efficacy of an innovation after it is evolved and implemented.

(g) The organization and management should also be researched into. We have all kinds of elementary and secondary teacher education programmes. Courses are offered by correspondence, part AIR and part contact-cum-correspondence, etc. At Master's level there are M.A. (Ed); M. Ed. and M. Sc. (Ed) courses. In all these the requirements for the fulfilment of the degree are also different. Ranging from specialization in one or more areas, it is possible to obtain a Master's degree in education by dissertation alone. Also, in some universities an M.A. without B.Ed./B.T. is also possible to obtain. The comparative adequacy of these programmes is now ripe for research.

(h) We hear a lot of criticism of the Herbartian steps but there is little empirical research to support or validate this negative criticism. Besides the ritual of criticizing on inadequate grounds the existing student teaching programme, alternatives have been found wanting. Why should this be so, one would like to ask. Further, methodologies of teaching must vary a good deal according to the situations in which teaching is conducted. Now that we are approaching the literate as well as illiterate masses through SITE and radio, the teaching methods must be suitably modified. Little attention, if at all, has been paid to this aspect of teaching methods. A whole range of formal and non-formal teaching is found essential, but there are no corresponding teaching methods for either instructors, student-teachers, programmers or others. There is scope for experimentation in this rich area, more so in finding the characteristics of teacher-leaders in non-formal situations. It might not be easy to transfer these characteristics because some of these would not be teachable but surely some could lend themselves to teaching in formal situations. Indeed, one would be interested in finding whether or not a non-formal teacher-leader can be trained. Also, whether there are certain qualities that are found necessary for the non-formal situations that can easily be institutionalized.

(i) The other area which is rich in potentiality is that of teachers' role perception. The role perception can be visualized in numerous ways: on time scale perceptions of pupils, self, general society, colleagues and bureaucrats. Studies have been conducted in this area but the underlying message of these studies has been missed in the hurry. To our mind the role perception has an attendant meaning. The roles as perceived should be directly reflected in the course offered at all levels.

Surprisingly this area is being researched, independent of its examination from the point of view of suitability of its findings for teacher education programme

II. *Contemporary Trends*. For the purpose of assessing the contemporary trends we have consulted *The Third Year Book of Education* (NCERT) and *A Survey of Research in Education* (CASE, Baroda). The NCERT publication has indicated the following broad headings based on the research titles available until then

(a) *Attitude Studies*. This covers the studies which we have proposed under (i). As already noted these are, from our point of view, incomplete and inadequate researches.

(b) *Problems of Teachers : Personal, Social and Economic*. These are all dated studies as they were made about a decade back. The problems remain and shall never entirely vanish. In the present context, however, the nature of problems that teachers face must have undergone changes. A fresh look is therefore essential. As a point of reference earlier studies can be useful.

(c) *Selection and Qualities of Teachers*. As an area of research this should be of perennial interest. The qualities of teachers are of universal importance. However, this is not true of selections. The employment market exercises all kinds of pressures on the selection procedures at all levels and in all types of institutions. For example, at one time B.Sc. course was rated high and, therefore, admission tests to these courses were pretty stiff. In U.P. it was difficult to find qualified science teachers. A way was, therefore, devised to appoint all science graduates who had taken their teacher-education degrees. This is a mere illustration and explains how selection procedures can be changed. There is a need to change these afresh, considering the problems teacher-education programmes are facing now.

(d) *Interests and other pursuits of Teachers*. This is another fruitful area and has tremendous scope for further research. Also this area is of perennial importance. Particularly, the male-female, urban-rural differences in interests can always help design the teacher-education courses.

The CASE publication which is under revision has indicated five major categories :

AREA I : Selection criteria, abilities and qualities of the teachers.

AREA II : Pre-service and in-service training of the teachers.

AREA III : Work load, job expectation and difficulties experienced by the teachers.

AREA IV : Procedures and practices of teacher-education in India.

AREA V : Personality variables of teachers,

If carefully analysed, it would be evident that the NCERT publication has given more broad categories than those given by the CASE publication. Apparently there are overlappings between the two which merely shows the limitation of these categorizations. Two areas have been completely left out; (a) the rural-urban bias of these studies is not clear, and (b) the effectiveness of teacher education programmes under different categories has not been touched. Taken as a whole, teacher-education as an area has not been thoroughly explored. We have also ignored the comparative picture of the teacher education programmes in other countries.

III. We now come to the third part of our paper. We may give here a few topics from each area that we had indicated. This is being done to facilitate the work of the prospective research scholars in this area

*List of Topics in Each Sub-area of Teacher Education*

We have already indicated certain areas where some research is needed. We have not overlooked the fact that besides several stages of teacher-education which fall under the category of pre-service, there are areas of in-service education as well. Neither have we neglected the problems of discipline, teacher behaviour, teacher awareness, etc. nor have we paid less attention to the areas of research which emanate from philosophy, sociology, economics, etc. We hope we have covered almost all the aspects of teacher education. It would be apparent after going through the topics which we have suggested that they are not entirely new or unthought of. It is also partly correct to say that these problems have not been properly formulated. Proper formulation of these problems would be done at the time of the actual selection and also when the work is about to be undertaken. It is unwise to define an area of research merely from one point alone. It is possible to do so from several angles and in fact that is what matters most. Certain topics are being suggested for their selection and suitable formulation. Incidentally, let us make another point clear at this stage. We have not classified these topics into sub-groups or listed them areawise. The list is random and is merely suggestive.

*Research Topics*

1. Profiles of the work-style of leaders in non-formal education.
2. A critique of the role perception of the first generation scheduled caste/backward class lecturers.
3. A comparative study of attitudes towards teaching between the equally matched groups of first-generation and third-generation teachers (inclusive of the caste and income-based variations).
4. A study of role perception of the teachers in the urban-rural elitist setting (Stagewise/institutional, controlwise).

5. A study of role performance among the teachers in urban/rural areas (stagewise/institutional, managementwise).
6. Case studies of unmarried/married with children and widow teachers with a view to preparing *profiles of dedication towards work*.
7. Teacher requirement (subject/stagewise) in A. D. 2001—a study in futurology.
8. Studies in manpower planning—reasons for failure/success, grounds of work/new hypotheses.
9. Innovative practice—sample surveys.
10. Analysis of common-room conversation of the teachers in the context of stress/joy/scandals and political events.
11. Puritans and punishment—case studies of cruelty practised by the teachers
12. (a) Age and creativity.  
(b) Climate (management) and creativity in teaching innovations.
13. Celibacy and punishments—case studies of cruelty practised by the teachers.
14. Perfection and cruelty—psychopathological models of deviants among the teachers.
15. Teaching effectiveness and vocal/verbal facility.
16. Profiles of 'model' teachers—a case study approach.
17. Teaching methods, efficiency and role performance—sample surveys of equally matched urban/rural teachers from both sexes.
18. A comparative study of teachers with or without service experience (other than teaching) and its impact on the efficiency of the teachers.
19. Fears among the teachers—their nature and structure.
20. Fears and effective teaching.
21. Reading habits of the teachers—patterns, needs and attitudes.
22. Questions in the classrooms—teacher reactions (sample surveys—urban-rural; govt./aided; male-female).
23. Anxiety among the teachers—future, family, effectiveness in role performance, etc.
24. A comparative study of the status of teachers and others—qualifications, income, future prospects.
25. The Indian teacher—socio-economic origins.
26. Typologies in teaching—actual classroom practices.
27. The sociology of teaching profession.
28. Philosophy of teaching—a critique.
29. The economics of teaching as a profession.

- 30 History of teaching profession in India.
31. Teaching in an underdeveloped country—case studies.

*Some practical suggestions for research*

Aware as we are of the different requirements for Ph.D. registration in the Indian universities, we ascertain that there are points where all these requirements converge. The common requirements can be seen in the research proposals and steps that researches follow. A research project is a response to some felt need, whether internal or external. The internal needs are satisfied by the logical pursuit of thought processes and, therefore, researches in such realms are mostly philosophical in nature. Otherwise research is a response to an external requirement, whether of finding a solution to an obstruction in one's job performance or out of sheer interest in a particular problem which has caught attention. Added to this are certain other motivations too that may not be so mundane after all.

It is quite probable that a research may not lead to any solution. Years of conscious and sincere efforts may leave the problem as unresolved as ever. This is equally true in physical and social sciences. By and large there are problems that lend themselves to solution and therefore research acquires the distinction of being applied. Even the so-called fundamental researches may be belated in application.

The stages of a research are well known. A good number of books are available on research designs. Our purpose here is merely to help both the novices and old hands to take up research in new areas. We would illustrate the same with the help of examples from the topics that we have selected.

Take, for instance, the case of cruelty among teachers. A few teachers are unnecessarily cruel. This cruelty could be a symptom of some malady that these teachers may be suffering from. It is possible that this cruelty might emanate from the puritanic attitude a teacher may have socially inherited/acquired. Cruelty can be born as a side-effect of celibacy/virginity. Chances are that (perfection) as an ideal may haunt some and this might lead to psychopathological deviations leading to cruelty. In other words there are chances or possibilities that cruelty among teachers as a well-defined characteristic of classroom behaviour may be an indirect result of any particular or a cluster of given reasons. If one started analysing all these against a stated reason that would be the hypothesis. This reason may or may not be found accountable for the phenomenon of cruelty. One could, therefore, examine the nature of cruelty against a well-defined reason. Incidental to this would be his attempt to find whether similar, identical studies have been conduc-

ted elsewhere. This step is what is called a survey of "relevant studies". It helps a researcher to formulate his/her problem distinctly and clearly. Even in the designing and data collection lot of help accrues from these studies. It is an important part of any research work. Rest of the steps are pretty simple. Data are classified and interpreted. Lastly, in the "conclusion" or what can be called the "summation" of the entire research findings and interpretations, the earlier hypotheses are tested. Unnecessary as it is to anticipate results, it is equally unwise to imagine that research findings would necessarily vindicate one's hypotheses. They might as well negate each one of those and establish something quite unanticipated. The 'concluding chapter', therefore, is as important as the opening chapter. As is true of any standard publication a lengthy and complete bibliography must follow. This is both an index of one's total work done and a guide to future research.

In the list of topics that we have suggested all kinds of research tools would be necessary. Ranging from simple questionnaire to detailed and depth interviews should be found absolutely necessary. Tape recorders and long schedules may have to be employed. But the tools by their very nature are of a very limited value and would not be a substitute for the researchers' intelligence, power of observation, intelligent variation in the employment of research tools and approaches, etc. Tools are merely used for given purposes. Their selection would depend on one's needs. For case studies, the data on all aspects of the information must be collected.

We have made reference to an interesting study on the teachers' common-room conversation. It is quite natural for any group of persons to engage in conversation. Such conversation can cover any topic under the sun. Particularly exciting are the days when the teachers either singly or as a group learn about something like a local scandal, political event or receive a harsh bureaucratic order. We are interested in researching into this sociological phenomenon. A question may be asked how does this all form a part of educational research and what would be its practical implication. Our answer to this query is simple: Any information about the teachers, whether direct or indirect, increases our ability to learn a group's behaviour. If one comes to know a specific piece of information about them that only leads to better pre-service education to teachers. One could also think of anticipating the teacher behaviour under stress. This surely would give an added advantage to teacher-preparation programme. Further, conversation of any group of people is very revealing. It betrays the status of persons who are conversing. In fact, it is possible to prepare class index based on conversations of different people.

It is possible to gather information by observation-participation. Additional information can be had by planting a tape-recorder which may not be known to anyone. Ethically this may not be a very laudable method/technique of collecting information. But perhaps some information have to be gathered unnoticed. Situations of stress, pain or joy are interesting and must be classified as such.

Apart from the systematic observation, experimentation can also be helpful in collecting reliable data on problems of teacher education. An experiment is observation under controlled conditions. This control can be introduced by manipulating independent variables and the data collected can be used for verification and confirmation of the working hypotheses. Multiple experimentation is more typical of science than social sciences and humanities and education is not independent of social sciences. We should take up crucial and important educational problems and if the experiment is once successful, it should be replicated and cross validated. Attention should also be paid to internal and external validity by controlling different extraneous variables, viz. history, maturation, experimental mortality, etc. Statistical procedures can be helpful in making these experiments more scientific.

These experiments can be of different types depending upon the nature of the problem. In some experiments only one independent variable can be manipulated and its effect on the dependent variable can be observed. In slightly more complicated cases the effect of more than one independent variable can be studied. For the selection of experimental and control groups, the matched group technique should be employed so that a complete control over other variables can be exercised.

Suppose we have to see the place of maps and charts in teaching history to the students of Class VII. This problem can be studied through experiments. We will select two groups of students similar in terms of their interest, aptitudes, attitudes, intelligence, age and socio-economic status. The same teacher should teach the same subject-matter to both the groups. The students of the experimental group should be shown maps while discussing different achievements of the specific period, while the students under the control group should not be benefitted by that. The effect of the use of maps, etc. in teaching history can be studied through the total time taken by the students for understanding the matter, their class performance and their test scores. This experiment should be repeated with complete control over other variables, viz. class environment, length of period, teaching method, etc. The generalizations should be drawn on the basis of the results of repeated experiments on the same problems. The information thus collected is more reliable than information obtained through the application of any other research methods.



We now intend to show that according to the standard American and Indian works there is plenty of scope for research in teacher education, we are lucky to have with us as reference a list that we prepared for the CASE, Baroda of the Indian Ph.D. scholars abroad. In this list we find only half a dozen studies in all that pertain to the area of work in reference.

Though it is an old book, N.L. Gage's *Handbook of Research on Teaching* is worth consideration. Its preface explains the conceptual frame work that might provide an insight into research in this area. The entire book was intended to bring research on teaching into more fruitful contact with the behavioural sciences. The conceptual frame took into account three major classes of variables, central variables, relevant variables and site variables. The central variable was defined as one that refers to the characteristics of teachers. This was further subdivided into three categories: (i) teaching methods (ii) instruments and media of teaching, and (iii) the teacher's personality.

Gage calls relevant variables those which refer to antecedents. Two loci in these are (1) social interaction in the classroom, and (2) the social background of teaching. Looked at from another viewpoint these two are tantamount to stressing on the pupil-teacher relationships and the social background of the teaching personnel.

The third category of variables is called the 'site' variables which pertain to grade level work and subject-matter.

Woven around these three sets of variables are studies that one could conduct in the area of teaching. This then is the major contention of Gage.

As a logical framework all this satisfies the need for a proper classification of research possibilities in this area. However, one could discern a major lacuna in the present framework. It does not take into account the studies of fundamentally research nature like dealing with the philosophical aspects of the problems and the international comparisons. Our contention is that teaching as a profession and as an activity can be compared in their nature and background. It is necessary to look from an international perspective whether or not teaching has a streak of philosophical and social content running through its structure. This according to us is as important an aspect of research as any other. There are also conditions that are peculiar to a nation which have no counterparts elsewhere. For instance, the problems of minority communities may be common but not the historical exigencies of tribal culture or the problems of teaching in a denotified area. This peculiarity apart, rest of the components of teaching either as a profession, activity or socio-cultural interaction fall into a pattern and can easily be identified with

N.L. Gage's paradigms for research on teaching. In a detailed study we could have easily covered most of these issues. We are sure that a conscientious research worker would like to compare our framework with that of Gage's and notice a number of similarities. It is possible to conduct a serious study in this aspect of paradigm designing and defining the parameters of work within this narrow field alone.

As referred to earlier, we have a Ph.D. index on Indian scholars abroad. These studies are of an elementary nature and do not betray any designing in them. Neither do they show any consistency in the choice of subjects with a view to developing any special expertise on India and in the field of teaching. Also, numerically they are only five and not more than one study has been conducted in the areas of (1) Preprimary, (2) Elementary, (3) Secondary, (4) Post-Secondary and (5) Technical education. In other words, they do not go beyond grade studies which Gage tries to cover under 'site' variables. Their usefulness for the resolution of any Indian problem is also highly restricted.

We have selected a few significant studies from the survey of the case, Baroda. Several new areas have been suggested like experiments on simulated teaching, microteaching and interaction analysis on p. 424. The studies we find of particular significance are by S.B. Adaval, N.L. Dosajh, N.V. Manuel, G.K. Samanta Roy, M.R. Santhanam, S.B.L. Bharadwaj, O.P. Bhatnagar, G.N. Chatterji, D.C. Joshi and I.B. Verma.

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- SANTHANAM, M.R. "A Study of the Patterns of Teacher Influences in Some Selected Schools", Ph.D. Edu., M.S.U., 1972
- BHARADWAJ, S.B.L. "Vocational Interest Patterns of Prospective Teachers of Higher Secondary Schools in Uttar Pradesh," Ph.D. Psy., Lucknow University, 1959
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JOSHI, D.C. "A Study of Innovations and Changes in Teachers' Colleges,"  
Ph.D. Edu., Udaipur University, 1972

VERMA, I.B. "An Investigation into the Impact of Training on the Values,  
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Lastly, certain experiments have been conducted in this area at different places such as in Rajasthan, Uttar Pradesh for primary teacher education, and in Karnataka by trying the untrained teachers in schools before they are awarded their training degrees. These obviously need further replication and propagation

In this part of the present paper we intend to give the dimensions of teacher behaviour and his/her imagined or actual role performance. This has been done for the purpose of identifying areas of research in teacher education. It would be noticed that we have given topics from almost all the areas and have attempted to help the prospective Ph.D. scholars by explaining the necessary steps. Now we present the chart with the teacher as the centre of our studies and his activities as focal points for consideration. From each one of these one could identify numerous research projects and work undertaken. We have deliberately not attempted to differentiate between the teacher and teaching because in the classroom situation both are inclusive and totally interdependent.

The first dimension is the origins and the social bases of the teacher. This could easily be studied against the background of philosophy, psychology, sociology, etc. more particularly the learning tradition aspect of it. Learning traditions can be determined in terms of class, caste, cultural levels, etc. Special emphasis could be paid to the personal motivations and aspirations.

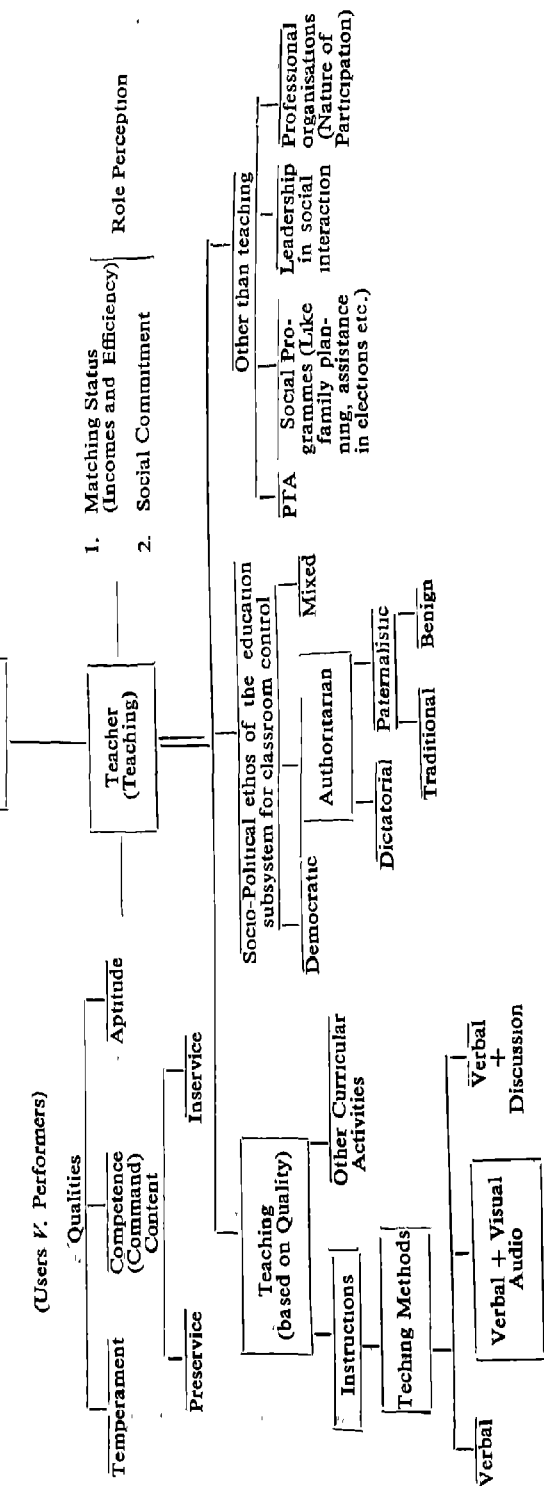
The second aspect of our proposition concerns the quality of teachers. The quality has as its components : temperament, competence, i.e. command on the content matter and aptitude. Needless to say that competence is a by-product of the pre-service or in-service education besides the basic degree qualifications like graduate or postgraduate degrees. These qualities have a special relevance for users and performers both.

The third aspect of our teacher is addressed to the problem of the comparative status of equally qualified and identical income groups. One would naturally like to know how does our teacher compare with others. If one is sensitive one would surely like to perceive one's role vis-a-vis social commitment, personal commitment and standing in society. There are tricky problems and their inaccurate perception based on imperfect data can lead to wrong conditions. This adds to the importance of the research work to be undertaken in this area.

# THE DIMENSIONS OF BEHAVIOUR AND IMAGINED OR ACTUAL ROLE OF THE TEACHER FOR IDENTIFYING AREAS OF RESEARCH IN TEACHER EDUCATION.

Role Perception + Role Performance = Users/Employees + Performance/Employees  
(Societal needs and personal background)  
Teaching traditions (Philosophy, Sociology, Law, etc.)

1. Class
2. Caste
3. Cultural Levels
4. Aspirations



Micro teaching/A.V. aids/Labs, etc. (by Typology)  
N.B. : Each one of these areas either in terms of problems, social origins, role, provisions, utility, etc. could be compared and presented internationally.

The fourth and the final dimension of teaching and teacher is concerned with the activities or what we call actual role performance. The first three are the determinants of teaching but this one is the end product. In other words we have only two classes of researches in the area of teacher education and our departure from N.L. Gage can be discussed at this stage and from this point of view.

The teacher's activities constitute actual classroom teaching irrespective of the methods a teacher employs besides the classroom control which forms largely a part of the teaching activity. The teaching methods can be varied according to the topics and the content a teacher has to handle. These methods and their efficacy in given situations can be a subject of research work.

The socio-political ethos of the educational sub-system would determine the type of classroom control that is possible in a given school. This management and organization has a definite bearing on our school activities. A teacher also keeps himself busy in what are termed as "extramural activities". In all these situations his role is mostly leadership role. We are noticing that this position is under serious threat.

Each one of these areas, in terms of problems, social origins, role, provisions, utility, etc. could be compared and presented both nationally and internationally. This would finally lead to the theoretical generalizations and designs conceptual frameworks. This should in any case be the final product of any good research.

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# Social Structure and Processes in a High School in South India

## A Participant-Observer Analysis

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*This report presents an account of an informal study undertaken by the author with regard to the social structure and processes of an aided high school in the capacity of a participant-observer. An opportunity for this came when the author was required to work with the B Ed. trainees as a full-time internship (teaching practice) supervisor for a period of over two months at the Canara Boys' High School, Mangalore, Karnataka State (India).*

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### PARTICIPANT OBSERVATION ANALYSIS

PARTICIPANT observation usually refers to a situation where the observer becomes as near as may be a member of the group he is studying and participates in their normal activities. The term was originally used by Hader and Lindeman<sup>1</sup> to refer to work done in industrial consultation committees where actual members of the committee were trained to observe what happened at meetings in detail and then were questioned afterwards by research workers. The term has also been used to refer to the work done by anthropologists who have lived with tribes they have studied. But

the term is increasingly being used now-a-days by research workers while describing methods of sociological enquiry.

"The method of participant observation leads the investigator to accept a role within the social situation he studies both by participating as a member of the group and by observing it"<sup>2</sup>. This method has a notable advantage in as much as the researcher joins in the daily life of the group or organisation he is studying rather than obtain information by questioning informants through correspondence or in an interview. The ordinary interview situation is such a highly artificial social situation that both questioner and informant are in false positions. The participant observer watches what happens to the members of the community and how they behave and he also engages in conversation with them to find out their reactions to, and interpretations of, the events that have occurred. He studies the life of the community as a whole, the relationship between its members and its activities and institutions—the type of study typical of social anthropology. One of the most fascinating uses of participant-observation was made by John Howard Griffin<sup>3</sup>, an American writer, who had himself injected with a preparation which gave him a coloured pigmentation and then lived in several towns in the U.S.A. for a month as a negro. This study, not strictly academic, but far more enlightening than many a more theoretical study might be justified for the good it could do to help white people better understand what colour discrimination is like at the receiving end. In a less extreme situation of participant observation William Whyte's<sup>4</sup> study of American gangs in *Street Corner Society* shows how a deep understanding of groups can be gained by genuinely participating in their actions. Whyte himself became a member of the gang he studied. But it could hardly be said that he was *wholly* accepted, since his status was always that of an observer and therefore an outsider.

The present situation was a unique one in so far as the staff of the school had already offered to cooperate and extend needed facilities for the researcher (as internship supervisor) thus making the work of the researcher quite smooth in order to get started at the project. Thus the researcher entered the school as a participant observer (in addition to his duties as internship supervisor) armed with his own training and teaching experience and with the intention of examining the schools' social structure and processes.

### OBJECTIVE

The objective of the investigation was to study, as a participant observer, the social structure and processes in a high school with special reference to the behaviour and attitudes of pupils and teachers in the school and their relationship with one another.



*Limitations*

1. Since the investigators' declared job was to supervise the internship programme of the teacher trainees in collaboration with the cooperating teachers and the headmaster, the concerned staff and students, to begin with, never doubted this primary objective of the authors' work and stay in the school. However, when the headmaster welcomed the idea of an informal study of the school by the author and made known this fact to the staff concerned with an appeal to extend all possible cooperation, this subjected the investigator, at times, to suspicion of a double role.

2. The findings in the report do not reflect any objective investigation of various aspects of the social structure of the school. Nor was the data obtained subjected to any sophisticated and vigorous statistical analysis. The social system was conceived and treated as a unity on the rationale that analysis of any one aspect of the social system of the school is inextricably bound up with all others.

## METHOD OF STUDY

In the participant observation as a method of social enquiry, the observers' task is to place himself in the best position for getting a complete and unbiased picture of the life of the community under study. In his section on this method of enquiry John Madge says that "when the heart of the observer is made to beat as the heart of any other member of the group under observation, rather than as that of a detached emissary from some distant laboratory, then he has earned the title of participant observer."<sup>5</sup> As a participant-observer, the author, in the present study attempted to study the value system of the school both in informal situation and formal participation in various programmes conducted for the benefit of the staff and the students. He made himself a member of the group so as to be able to experience what the school community experienced and worked within their frame of reference.

The author observed teaching-learning process, took some classes himself, observed the pupils in classes conducted by various teachers, conducted interviews with boys and teachers, used every available opportunity for informal discussion with them, accompanied the boys on some of the official school visits and holidays and joined them in some of their out-of-school activities. This facilitated a more authentic picture of the school community—the relationship between teachers and students and their attitudes to each other, among themselves and the activities. As could be understood, in a situation such as this, a lot depends on the observer himself if his real status is known, if he is an easily adaptable person then he could fit into the group quickly and easily and perhaps not affect the

group's actions and discussions at all. Nevertheless, a true group member plays the some sort of role to fulfil and the *known* participant observer is in a difficult position.

### *Participant Observation and Role-Set*

Since there is a danger in 'role' being interpreted in rather ambiguous terms, it may be helpful to distinguish between role-performance and role-expectations. Most roles are performed to different actors or groups of actors who may have differing role expectations. It is this complement of role relationships which Robert K. Merton has termed as 'role-set'<sup>9</sup>. The 'role' thus comprises the sum of the expectations of all members of the role-set pupils, colleagues, headmaster, parents and others—the first two being those to whom the teacher principally directs his role-performance.

### *Role-Conflict in Relationship with Teachers*

The teachers in the school hesitated to ascribe a teacher-role to the author for the simple reason that he had come to the school in the capacity of a supervisor of the B.Ed. trainees. To observe them (the teachers) within the confines of their own classroom involved to almost all of them a disruption of their usual autonomy and upset beyond any shadow of doubt their ascription of a teacher-role to the author. The teachers, to begin with, could not reconcile with the idea of author's being an observer of their performance. Instead, his role was considered more that of an inspector. In the situation, the insulation of the teacher's role-set ceased. The conflicts between the teacher's self-image and the expectations of an observer seemed manifest.

Initially, some teachers reacted with a sort of indifference and tended to withdraw their cooperation making the job a little uneasy. Whenever a teacher was approached for permission to come into a lesson conducted by him, an indirect hesitation would be shown: one teacher would say that he was going to conduct a test on that day and that there was nothing special to observe. Another would send words beforehand that he had planned independent study for the pupils so as to let them have a follow-up of the previous periods' work with library reading. Still another teacher would pretend that he was going to discuss with his boys certain aspects of their term-assignments and that no particular lesson was going to be conducted on that day. However, whenever the author happened to go into a class, the teacher made an attempt to take the author into confidence with regard to various pupil-teacher activities. Mr. 'X' usually set the form some written work and then joined the author at the back of the room where he tried to impress upon him the advances of pupil-centred

instruction presumably conducted and organised by him (the teacher). Most often, he would pick up a few educational terms from the author's conversation with him and seemingly take them as 'source of inspiration'. It was rather difficult to have thought a way out of such flattering comments without offending the teacher.

A number of teachers appeared to behave quite naturally as if there was none to observe in the room and so it was difficult to check on the extent of the changes the author's presence produced

Sometimes the teachers would themselves indicate the effect of the author's presence. At the hands of certain authoritarian teachers the pupils would be rebuked and spoken to in very harsh language. It was notable how very rarely a teacher rebuked a boy in the author's presence. One day Mr. 'Z' in the course of a conversation strongly pleaded for teacher's considerate style of addressing the pupils' but in the same breath asserted that in his form 'some children do not understand the language of courtesy' and that only rebuking worked with them. A further check came from the conversations with the boys who revealed changes which might otherwise have not been at all obvious. One of them said : "During your presence he pretends to be calm but comes out in true colours, the moment you have gone out".

As of boy's behaviour, author's presence seemed to cause some changes for once the boys were used to the author's approach, they spoke up. One of them observed :

Much depends on the teacher and the way he tackles the problems of pupils. With Mr. 'L' and Mr. 'M' we never enter arguments. They are strict and we do what they want us to do. But it is different with Mr. 'N'. Like when you came in the other day when we were taking a test in social studies. A considerable number of boys were copying from the notes. But it all stopped as soon as you come in.

Most of the boys who expressed such ideas belonged to the rural areas who were generally considered unruly and perhaps it was these boys who were uppermost in the teacher's mind who had commented that some boys in his class "did not understand the language of courtesy".

Sometimes the teachers went out of their way to impress upon the author their deep faith and active interest in progressive techniques of teaching like team-teaching and workshop way of teaching, and this came in direct conflict with their actual behaviour as reported from other sources. Mr. 'M', an advocate of dynamic methods of teaching in the author's presence, was often quoted by pupils and some teachers having talked rather loosely about the progressive techniques. His expressed

opinion seemed highly contradicting his lecturing to the author. Such attempts of deception (or double role) probably resulted from the ascription to the author of an inspector-role. Yet the latter's continuous presence in the school, unlike the brief visit of an inspector made such attempts at deception detectable.

It was possible to shed the suspected inspector-role to a large extent by means of a constant participation in the informal social activities of the staff and the consequent initiation and acceptance into the informal relations. It was possible to obtain a degree of mutual identification with the teachers when matters concerning class discipline, for example, came up for discussion. This paved the way for renouncing any expertise or authority that are part of the inspector-role. An index of the increasing cordiality of relations with the staff was the extent to which the author was drawn into the informal activities; attending staff parties, helping with the school extra-mural activities, participating in the morning assemblies, witnessing club activities, etc., etc. At times, however, the author was forced to be drawn into controversies when a gossip in the staff would ask author's categorical opinion. This was unfortunate but inevitable. Such a situation undoubtedly overrides observation. But non-participation in the social life of the teachers could have been misinterpreted as indifference and a desire for social exclusion, cutting at the very root of the basic purpose of the author's work.

A considerable number of teachers never realised that some of their casual remarks made it possible to get a pretty good picture of the things around.

In an article on participant observation, Dr. Frankenberg observes that

If the observer cannot participate with the knowledge and approval of the people to be studied, he should not be there at all. The observer has a positive duty to be open that his intentions are to observe, to report and to publish an account of what he sees...<sup>7</sup>

The personal touch and informal behaviour of the author, most often, resulted in certain apparently trivial utterances made by the staff which were of no mean social significance. That is to say that there was a certain amount of deception involved. Dr. Frankenberg's dictum, therefore, though highly commendable in theory oversimplifies the practical situation as far as the present investigation is concerned.

In any social situation members of an organisation have to rely on one another and thus developmental cooperation and obligations. The author had naturally developed ties and obligations with the staff members and the headmaster of the school. Many a time the author's

role caused him to be used by the teachers. A chit was found one day on the author's desk asking for his assistance in conducting practicals at a time the author was not free.

Even a most polite note of explanation pointing out the author's preoccupations that day seemed to earn the teacher's displeasure. Some teachers were bent upon taking full advantage of author's obligations in the school. Mr. 'M' asked the author to talk to a parent who had been sent for by him about his son's bad behaviour toward the teacher. Mr. 'N' being found missing from the class by the headmaster told him (the headmaster) that he had been called by the author for some work and that he could not refuse even though he didn't want to leave the students unattended. The author would not have known this had the headmaster not mentioned about it in one of the informal conversations. Mr. 'O' used the author as an incentive to involve some unwilling boys in arranging an exhibition. He told them that the author would inspect and examine the work. He then invited the author to visit the exhibition arranged by his boys as a culminating activity of their social studies project in which the latter had shown some interest when the project was undertaken. The most saddening thing was that whereas the author was trying to divest himself of an inspector-role with regard to boys, Mr. 'O', by asking him to judge and rate the boy's work was assigning to him, in the eyes of the boys, the very role he wished to avoid.

By the middle of the term, the inspector-role started beginning to be replaced by a teacher-role which could partly be attributed to the author's identifying himself with the school community, i.e. freely mixing up with the staff and students and partly due to his taking charge of the classes in case some teachers were on leave or were busy otherwise. It so happened once that the students organised a cultural programme in connection with the Ganesh Puja (worship of Lord Ganesha)—a rather popular religious event in the southern part of India. A teacher who knew the author's denominational affiliations as entirely different from that of the devotees of Lord Ganesha and had anticipated his not being interested in the Puja (worship) aspects, wanted him instead to evaluate the test scripts of his boys so as to enable him to prepare marks lists for submission to the headmaster in time and at the same time help in the cultural programme organised by the boys. He was terribly annoyed when told that the author considered it extremely important to watch the cultural programme especially when it was a novelty for him. He failed to appreciate the author's need for observing the programme as part of his job. He considered the author an ordinary member of the staff or probably a guest artist in the drama of the school and not a social psychologist who had a definite purpose at hand.

Success in the acquisition of teacher-role had its side-effects too—a sort of professional jealousy among the fellow teachers. Mixing up with the students at the playground or in the cafeteria was looked at as an attempt to gain cheap popularity. Dinker in IX B who was condemned as one of the most arrogant and mischievous boys by many teachers secured next to the top position in the class test conducted by the author. Mr. 'M' who had condemned Dinker as a 'useless guy' started referring to him as "Anand's blue-eyed boy". Such satires though insignificant did have a disturbing influence and sometimes made the work somewhat difficult.

### *Role-Conflict in Relationship with Boys*

The role-conflicts experienced by the author as a teacher-researcher in his relationship with the boys presented interesting and challenging tasks. To begin with, the boys inevitably ascribed some sort of teacher-role to the author as they considered him one among the trainees. However, they didn't take much time to discover that he had to do something with the supervision of the intending teachers for they would notice him correcting lesson plans and observing classes in which the pupil teachers would conduct their lessons. This made the boys ascribe a sort of inspector-role to the author. However, not very late, they found out that the author was a teacher as they would see him with a number of books, going to and coming out of library, attending the morning assembly regularly and using the school staff room. Thus the inspector-role was finally replaced by a teacher-role for the author's job looked to them more or less like one of those who would conduct formal teaching.

Of the first few problems faced while facing the boys, discipline in the class deserves special mention. In general, in that school the boys from rural areas were considered to be the 'trouble makers' and teachers were sometimes heard suggesting punitive action as a precaution against the increasing indiscipline. Since the author had to deal with the classes where most boys came from the rural areas, the whole situation presented both a problem and a challenge. It had been noted, however, during the earlier observation sessions that the so called unruly and low streamed boys would tend to react negatively to any kind of punishment. The problem was how to avoid being associated with the teachers whose main approach was usually a penal one and yet be in reasonably respectable position. An attempt was made first to make thorough preparation for the lessons together with a number of teaching aids and extracts from various references and then to encourage good questions and offer various solutions. The boys were given opportunities to handle various teaching aids and some who evinced greater interest were later involved in the

preparation of such aids. This not only solved the problem of having a disciplined class but also helped in establishing a rapport between the teacher (the author) and the taught

At times it was felt that some boys took a little advantage of the freedom given to them. Once two village boys requested the author to put in a word to their form teacher who had refused permission for their leaving the school before time to let them free for the whole afternoon for making preparations for the village fair that week-end. They were explained that that was a delicate matter and told that better they dropped the matter at that. They would still insist and seemed annoyed for allegedly 'not being helpful'.

It was realised all of a sudden that where the middle and the low streamed boys were extremely satisfied and enjoyed working with the author, a wave of resentment was spreading fast among the high ability group on account of author's presumed little interest in them. A few challenging assignments devised for them as part of their school work and an invitation to them for sharing the work of the author in tackling the problems of the two other streams of pupils proved very helpful. From that point relations with most of the boys from higher stream seemed fast improving. However, a microscopic minority was still not satisfied and would sometimes greet the author in a rather cheeky way. Such provocative remarks automatically ceased when the boys failed to elicit expected response

### CONCLUSIONS

In a social organisation such as a school there is a clear-cut distinction between teachers and pupils and the gap of status distinctions which yawns in between these two levels is not very easy to fill. Discussing the role of a participant observer, David Hargreaves observes as follows :

To participate and observe involves to some extent shedding the researcher-role, since participation means accepting in some degree a normal role within the social situation. But to accept such a role while facilitating the process of absorption into the community, entails limitations on materials obtained and bias in its interpretation.<sup>8</sup>

It can hardly be denied that the author's role in the Canara High School was one which could be described as external to its social system. Shedding the external role, therefore, was a prerequisite for accepting a teacher-role—the only way in the circumstances to identify oneself with the social system of the organization. The researcher-role was not

conspicuous because of its low visibility. For improving relations with pupils, the situation was a rather difficult one as it posed the problem of inhibiting relations with the staff. However, bold step taken in this direction generated practically no conflict with the staff contrary to the expectations of the author. May be once having been accepted as a part of the teaching community, no motives were attributed to the assumption of a more clear-cut pupil-role or a researcher-role. A careful calculation of role-play thus helped to combat conflicts in different situations and paved way for a thorough study and insight into the social system of the school.

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# Understanding Jean Jacques Rousseau and John Dewey

## An Essay\*

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*It has become a common cliché that John Dewey's 'pragmatic' and 'experimental' approach to education was something that had nothing to do with Rousseau's 'authoritarian' educational theory and that John Dewey laid down a blueprint for the 'growth' of the individual. In short, Rousseau and Dewey have been studied as two different philosophers of education (this does not mean that no one has found the similarities between the two, although no one has systematically investigated these, the entire problem being dismissed as assumed or implied), and for this none other than Dewey himself has been responsible. This writer maintains that there were strong resemblances between the approaches of the two to the education of the child. A further claim of this paper is that both Rousseau and Dewey, notwithstanding their non-conformity with the religious establishments of their times, were indeed profoundly religious philosophers and moralists (not, of course, in the Victorian sense of the term) who came to preach some kind of a secularized religion. Hence 'Rousseau's civil religion and Dewey's pantheism.*

*It is important to understand the deeper implications of Deweyan philosophy, especially when it is creating a profound impact on the educational reforms in many countries all over the world. It will not do to view the grand old Yankee as the apologist for technicism (indeed Dewey had admired the advances of science and technology merely, for toward the later part of his life he talked passionately about man's communion with his primeval source—Nature. The transition from an experimental position to a mystical position in Dewey's writings forms by itself a vast and vastly*

*fascinating subject, too broad to be dealt with effectively within the limits of a paper of this kind. What this paper has done is an attempt to illuminate this theme by underscoring its ideational relationships with the philosophy of that enigmatic Genevan*  
*—Jean Jacques Rousseau*

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*To expect one to be always consistent is beyond human possibility,  
 I fear !*

—JEAN JACQUES ROUSSEAU, *La Nouvelle Héloïse*

We live in a period of controversy without debate. Opinions clash without meaning...Everyone has at command ammunition in the form of received ideas and familiar names that are felt to be potent, conclusive...there is not time for doubt or subtlety about them. They are absolute, like a hand-grenade: release the pin, hurl the thing away from yourself, and it will score against the enemy.

THUS HAS Professor Jacques Barzun described the "military-industrial" temper of the polemics in education.<sup>1</sup> It is especially useful to be reminded of this admonition when John Dewey forms the subject-matter of a paper. Indeed, nothing better than the controversies over Dewey's educational philosophy illustrate the military-industrial temper of educational disputes. Dewey has had the singular misfortune of being misunderstood and maligned by his contemporaries as well as his successors. While Sidney Hook, the author of *The Hero in History* (N.Y., 1943), considered Dewey a hero and a prophet of this century,<sup>2</sup> another denounced the "progressive" and "pragmatic" education as "anti-intellectualism" and as "the education of a slave...not the education of a free citizen of a society that hopes to remain free."<sup>3</sup> Critics and commentators, too numerous or too familiar to name here, have sought to evaluate Dewey on variegated criteria. While acknowledging his intellectual debt to these scholars this writer, however, submits that of all the criteria with which Dewey has so far been examined, the single most important criterion that resolves some of the ambivalences and incongruities in his writings, remains the criterion of morality. It is not as an experimentalist or empiricist, but as a moralist, that Dewey has to be seen, if we are to understand his conception of the individual and society and his idea of school and education. Viewed thus, his debt to Jean Jacques Rousseau (1712-1778) becomes at once apparent perhaps more than Dewey realized

or recognized. It will be the purpose of this paper, then, to analyze some of the principal works of these two foremost educators of the Western world with a view to discerning their mutual compatibility, and their fundamental moral impulses which represented a kind of secularized religion.

## II

Rousseau recognized that man is not a dynamically empty creature. Their is "Nature within us", he wrote; there is an inherent directedness to the growth of human capacities. Through reason man acquires an idea of his perfection, of the obligations and values proper to his nature. Hence Rousseau's plea for the cultivation of the human capacity to reason: "Reason alone teaches us to know good and evil. Therefore conscience, which makes us love the one and hate the other, though it is independent of reason, cannot develop without it."<sup>4</sup> Reason is crucial to the realization of man's moral potentialities. In other words, Rousseau saw in reason the power to develop man's moral dispositions. Unfortunately, those critics who have argued that Rousseau disparaged the use of reason either overlooked or underestimated one important statement in the *Emile* :

When I want to train a natural man, I do not want to make him a savage and to send him back to woods, but that living in the whirl of social life it is enough that he should not let himself be carried away by the passions and prejudices of men · let him see with his eyes and feel with his heart, let him own no way but that of reason <sup>5</sup>

Again, some writers, including Dewey, appear to have overly emphasized the dichotomy between a 'natural' and a 'social' man in Rousseau's writings.<sup>6</sup> But, on a closer look, this dichotomy indeed becomes blurred. For his 'social' man must retain some measure of autonomy and moral independence against the undesirable and morally destructive social processes as this morally independent autonomous man must be alert to personal and egotistical bias. Moreover, Rousseau also thinks people are both psychologically and morally dependent on society, through which they can realize their moral potentialities. Society thus brings about man's moral transformation. One distinguished critic has aptly viewed Rousseau's conception of the relation between the individual and society as one of "dynamic interaction" of a "psychological group".<sup>7</sup>

This dynamic interaction underscores the notion of a "return to nature" as a demand for reassertion of individuality while at the same time this interaction recognizes the *moi commun*, the "common self", as the reality of man's moral potentialities. Thus is described the *moi commun*: "Each of us puts in common his person and his whole power under the supreme direction of the general will, and in return we receive every member as an indivisible part of the whole."<sup>8</sup> Strictly speaking, Rousseau is an advocate neither of autonomous individualism nor of totalitarianism exclusively.

His revolutionary idea of education, eloquently expressed in the *Emile*, is at once simple and profound. It is that education, to be effective in the making of good human beings and through them a good society, must be child-centred. The underlying assumption of the book is that children are living, growing beings who are persons in their own right capable of being prepared for later maturity only through the active interests of their own age and condition. "It is not enough merely to keep children alive", Rousseau said. "They should be fitted to take care of themselves when they grow up."<sup>9</sup>

The education of the child must not be verbal. "The only kind of lesson he should get is that of experience."<sup>10</sup> Books are the chief causes of the children's miseries. "Our first masters of philosophy are our feet, our hands and our eyes. To put books in place of this experience does not teach us to reason: only to be credulous and to borrow the reason of others."<sup>11</sup> Rousseau believed that it is through the senses that we come to the intellect and therefore he suggested that children attend to the phenomena of nature, encounter problems, and come up with solutions derived from their own experience. "Do not teach him science: let him discover it", Rousseau advised.<sup>12</sup> But he did not discount the role of teachers altogether. According to him, teachers should act as facilitators or, more appropriately, manipulators, of learning and providers of situations which will create a context for learning by experience. Probably a little initial guidance would be needed for the student, but nothing more. "If he goes wrong, do not correct his errors. Say nothing till he sees them and corrects them himself: at least, arrange some practical situation which will make him realize things personally."<sup>13</sup> Rousseau's education, then, is child-centred, experiential, practical, and pragmatic. It is designed to conduce growth to maturity leading ultimately to the making of a good citizen of a benign society. The supreme end of this education is, of course, the unfolding of man's moral potentialities.

## III

Dewey's "pedagogic creed" essentially drew on the educational philosophy of Rousseau though there are obvious distinctions between them.<sup>14</sup> Dewey recognized that "Life is the great thing after all ; the life of the child at its time and in its measure, no less than the life of the adult."<sup>15</sup> But, for Dewey, the unifying aim of education was "The growth of the child in the direction of social capacity and service, his larger and more vital union with life", and "discipline, culture and information fall into place as phases of this growth."<sup>16</sup>

Dewey conceived education "as the process of forming fundamental dispositions, intellectual and emotional, toward nature and fellow men."<sup>17</sup> Paradoxically enough, he also identified education with the living or the growing, described it as the "constant reorganizing reconstructing of experience", and concluded that education goes on "in, by, and for experience"—all of which imply that education has nothing to do with development of dispositions.<sup>18</sup> On the whole, however, his constant reference to formation of character, habit, attitudes, beliefs, and at least, one positive reference to "fundamental dispositions" gives a somewhat legitimate ground for the conclusion that the former necessarily involve the formation of the latter. The formation of fundamental dispositions of various sorts is not the final end of education. Nonetheless, it is a necessary precondition of education's achieving further ends

Dewey is against the fostering of all attitudes and beliefs that depend on a rationalistic theory of knowledge or a supernaturalistic metaphysics, or on an appeal to authorities in state and church. Elsewhere he makes a plea for the development of a reflective theory. "There is no better evidence of a well formed moral character than knowledge of when to raise the moral issue and when not."<sup>19</sup>

The acquisition of a reflective disposition or a habit of intelligence entails acquiring a complex excellence which is moral as well as intellectual. Reflection involves the inhibition of impulses, forging a will to know everything germane to the solution of problems at hand, learning to act on the basis of conclusions reached by reflection. In short, one must be able not only to think, but also to act intelligently. To have such a disposition is to have a character which "consists of an abiding identification of impulse with thought, in which impulse provides the drive while thought supplies consecutiveness, patience, and persistence, leading to a unified course of conduct,"<sup>20</sup>

Reflection, which is "active, persistent, and careful consideration", should be applied to moral questions. In other words, morals are to be evaluated on an experimental basis. Dewey contends :

The practical meaning of the situation, that is to say the action needed to satisfy it—is not self-evident. It has to be searched for...What is needed is to find the right course of action, the right good.<sup>21</sup>

In fact, for him, "there is no gulf dividing non-moral knowledge from which is truly moral." Whenever the knowledge of natural and physical sciences are seen to have a bearing on the common good, such knowledge can become moral. The criteria for judging what knowledge is moral, that is right, are thus utilitarian—the promotion of the common good. Though fixed principles or standards have little use for Dewey, nevertheless, he appears to have one. This is the utilitarian consideration of the beneficial consequences of any action.<sup>22</sup>

Dewey certainly denied that education was governed by any end or principle that had a fixed final end. But he never meant that it should be governed by no end or principle whatsoever. Indeed he implied that education had a purpose or an end :

Even when the processes of education do not aim at the unchanged perpetuation of existing institutions, it is assumed that there must be a mental picture of some desired end, personal and social, which is to be attained...Every care would be taken to surround the young with the physical and social conditions which best conduce, as far as freed knowledge extends, to release of personal potentialities. The habits thus formed would have entrusted to them the meeting of future social requirements and the development of the future state of society.<sup>23</sup>

Thus, release of personal potentialities and the development of the future state of society or a "bettered community life" are the twin ends of education. The first is related to what Dewey has called "growth", and the second refers to his moral concern for general welfare. An experience contributes to growth if it contains the "power to modify actions on the basis of the results of prior experiences, the power to *develop dispositions*."<sup>24</sup> Therefore, the end of growth is not just growth *ad infinitum*, but a well-directed development toward a self-capable of living a good life.

We see, then, that Dewey's ideals in education are not much different from Rousseau's. Rousseau had wished education to facilitate the unfolding of man's moral potentialities and to help him become the good citizen of a good society. Similarly, Dewey's education would release man's personal potentialities and would enable him to live in a bettered community. Of course, Dewey's ideal society was a democracy (though not a democratic society based on competitive individualism). He chose

democracy because "democratic social arrangements promote a better quality of human experience, one which is more widely accessible and enjoyed, than do non-democratic and anti-democratic forms of social life."<sup>25</sup>

#### IV

We have seen that if Rousseau had been concerned with moral questions in the *E'mile*, so was Dewey in his various writings. In fact, Dewey's moralism also comes out of the "pragmatic" approach of education that he outlined through the child's activities. According to him, the child is by nature active, and education ought to proceed by engaging and directing his activities in experiencing as well as solving problems. In his pragmatic approach, as we shall presently consider, Dewey was part of a tradition of which Rousseau had been a pioneer.

Although Dewey did not consider the term "pragmatism" very useful in characterizing his own philosophical position, and although he called his pragmatism "instrumentalism" or "experimentalism", he was nevertheless very much influenced by the pragmatic thoughts of Charles Sanders Peirce and William James. The influence of the pragmatic rule on Dewey's pedagogical ideas can be explained thus. First, an individual must put a concept to work relating it to some state of affairs in order to make that concept meaningful. Hence he suggested a curriculum which must be deliberately designed for communicating the meaning of the inherent relation between action and knowledge in a meaningful context of learning. Secondly, to know means to inquire or to reveal the nexus between means and consequences. If there are no actions, there is no consequence, and, in the absence of the latter, the object of knowledge is absent. Consequence or meaning is thus crucial to knowledge. It is also central to the theory of pragmatism.

Albert Schinz contended that Rousseau was the forerunner of ethical pragmatism which, as Schinz demonstrated, was the pragmatism of William James. The quintessence of ethical pragmatism is practical value, that is, practical reason, as opposed to pure reason, in other words, ethical results.<sup>26</sup> This ethical pragmatism was aptly called by James a new name for an old thing. He described his pragmatic philosophy thus :

The 'true', to put it very briefly, is only the expedient in the way of our thinking, just as the 'right' is only the expedient in the way of our behaving...On pragmatic principles we cannot reject any hypothesis if consequences useful to life flow from it...They [universal concep-

tions] have. no meaning and no reality if they have no use. But if they have any use, they have that amount of meaning.<sup>27</sup>

*Philosophia ancilla theologiae* of medieval scholasticism has been converted by pragmatism to *philosophia ancilla ethicae*.

Long before James, Rousseau had postulated a pragmatism when he had, as we read in the *Second Dialogue*, refused to "listen calmly to any theory that he believed harmful to the public weal."<sup>28</sup> For both Rousseau and James the whole problem of philosophy consisted in an identification of truthfulness and usefulness. "It is not a question of knowing things, but of knowing what is useful", Rousseau insisted.<sup>29</sup> For both the ultimate purpose of practical principles was to fit people for practical life as much as possible, and thus increase their general happiness.

Dewey, to be sure, did not align himself directly to Jamesian pragmatism, although he was influenced by James' psychological insights. On the other hand, he even belaboured over the possibility of identifying purely philosophical and pragmatic principles.<sup>30</sup> He remained closer to Peirce's pragmatic philosophy with respect to public and objective character of consequences.

Much of Dewey's own work in logic was devoted to the effort to demonstrate that the rules of logic are themselves emergents of the process of inquiry ... One of Dewey's most noteworthy contributions to the general pragmatic tradition was his relating of experimental method to the major aspects of value theory.<sup>31</sup>

Dewey's pragmatism grew in its unique way out of the general matrix of Western pragmatic thought. Rousseau's "ethical pragmatism" stood at the base of this tradition.

Rousseau indeed has succeeded in bedevilling his readers. His *E'mile* shows his attempts to educate a child in isolation from the corruptions of society, to make man autonomous, an end in himself. This theme echoes Rousseau's position expressed earlier in *La Nouvelle Héloïse* (1761) :

Man is too noble a being to be obliged to serve as a mere instrument for others, and should not be employed at what he is fit for, without also taking into account what is fit for him : for men are not made for their stations, but their stations for men.<sup>32</sup>



Juxtaposed to this notion of back-to-nature individuality we have his *Du Contrat Social* (1762) in which he appears to bind his citizens together into a monolithic moral unity, into the grim Civil Religion,<sup>33</sup> an attempt that has outraged many scholars. No wonder one critic is led to conclude that the philosopher "holds in his hands the keys of a terrible world."<sup>34</sup>

In fact, Rousseau, the author of *Émile*, *La Nouvelle Héloïse*, and *Du Contrat Social*, was a veritable *enfant terrible* at odds with his own physical and temperamental torments<sup>35</sup> as well as with a society he had come to despise. Probably he was aware of the totalitarian dimension of the society of the *Social Contract*. He himself was temperamentally far too unsuited for such a civil society. "My independent nature made me always incapable of the submissions necessary to whoever wishes to live among men", Rousseau confessed.<sup>36</sup> If the society of the *Social Contract* was uncongenial to him, he had sought solace in other worlds of fiction—the primitive and pastoral golden age of Arcadia (described in *Essai sur l'origine des langues*), the abode of primeval happiness, the dream world of the pedagogue in charge of Émile's education, and that paradise at Clarens where Wolmar, Julie, Saint-Preux, Claire of *La Nouvelle Héloïse* lived in harmony and mutual understanding. Yet Rousseau was painfully aware that these were but fictitious worlds. In reality the Arcadia was buried in the mythical past; primeval innocence was lost forever. Émile's conditioned impulses were threatened by the society that had resisted reforms, and Clarens was but a "paradise founded upon fraud" for M. de Wolmar, *le faux*, had manipulated everybody's lives for his own purpose. Thus the final hope rested with the society of the *Social Contract* which would herald true equality and a sense of belonging for everybody. But paradise thus regained was also a paradise lost. The natural man must give up his blissful *bonté* and cultivate virile *virtu*. In choosing the security of civilization he must transcend his narrow individuality and accept the rigors of community life. If Christianity must be abandoned because it was impotent and dysfunctional, the Civil Religion must be embraced, however grim and austere it might be.

Just as the revolutionary Rousseau has reared up the hopeful redemptive world of *la volonté générale*, the lonely dreamer, that *promeneur solitaire*, has also revealed its terrible dimensions. Like the Arcadia, the household of Émile and Sophie, and the congenial haven at Clarens, the society of the *Social Contract* might also come to its disillusionment. In order to forestall this eventuality, man must transform himself through a moral regeneration. From his *bonté naturelle* he must extricate himself and cultivate the self-denying *virtu*. Thus Rousseau solved the dilemmas of the evanescent moral community of the General Will and its totalitarian implications by a recourse to faith. Indeed, as M. Hubert had

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said long ago, Rousseau's contractual theory is a historical transposition of the religious doctrines of Fall and Salvation.

*The Creed Of a Savoyard Priest*<sup>37</sup> provided such a faith for the psychological reconditioning of the moral citizens. The Legislator of the *Social Contract*, like the pedagogue of the *Émile*, was the prophet of man's regeneration. "The Legislator is in all respects an extraordinary man in the State", who "puts into the mouths of the immortals that sublime reason which soars beyond the reach of common men, in order that he may win over by divine authority those who in human prudence could not move."<sup>38</sup> The Legislator is the supremely moral man ruling over a moral community. Unless a person detaches his own interest from the common interest—a possibility Rousseau had recognized—the society of the General Will "is always constant, unalterable, and pure."<sup>39</sup> Rousseau thus substituted Christianity with an austere, secularized religion.

## VI

In his study of Dewey's early writings between 1891 and 1894, John Blewett has observed "If a dedicated person is a religious person—a possible use of a notoriously nebulous word—then American history has known few such religious men as John Dewey."<sup>40</sup> Dewey's evangelical fervor and penchant for romantic prophesying were evident as early as 1897 :

Hence the conception of progress as a ruling idea ; the conception of the individual as the source and standard of rights...Given the freed individual, who feels called upon to create a new heaven and a new earth, and who feels himself gifted with the power to perform the task to which he is called—and the demand for science, for a method of discovering and verifying truth, becomes imperious.<sup>41</sup>

Dewey thus apotheosized the individual in 1897. Two years later he brought the individual and nature together in a "unity of function" generating a "movement in growth". A few years later, again, in 1905, he made man the benefactor of nature. However, for Dewey, nature became, and remained subsequently, "a kind of immanent substitute for the transcendence in Christianity and Hegelianism that he had abandoned."<sup>42</sup> In spite of his denial of any concern with ultimate origins, Dewey, in fact, became very much concerned with establishing nature as

the ultimate origins of all life, some kind of a 'mother' to man. In *Experience and Nature* (1925) he came to advocate "fidelity to the nature to which we belong." In his Terry Lectures delivered at the Yale University in 1934, he preached :

Our successes are dependent upon the cooperation of nature. The sense of the dignity of human nature is as religious as is the sense of awe and reverence which it rests upon a sense of human nature as a cooperating part of a larger whole. Natural piety is not of necessity either a fatalistic acquiescence in natural happenings or a romantic idealization of the world. It may rest upon a just sense of nature as the whole of which we are parts that are marked by intelligence and purpose, having the capacity to strive by their aid to bring conditions into greater consonance with what is humanly desirable.<sup>43</sup>

In 1941 he even confessed to Max Eastman of his devotion to a mystical poetic pantheism. Thus, as one recent critic has rightly argued, Dewey did have some kind of a theistic or pantheistic presupposition "which must qualify his claims to be an objectively scientific observer of natural processes."<sup>44</sup> Indeed it is significant that the post-Hegelian Dewey seemed, as he confessed himself, "to be unstable, chameleon-like, yielding one after another to many diverse and even incompatible influences."<sup>45</sup> He shuffled from man to nature and back to man with varying degrees of emphasis. But ultimately his devotion to mother nature became so over-emphatic that Jacques Maritain has justifiably remarked that nature became for Dewey some kind of Absolute substituting Christianity and Hegelian God of his youth.<sup>46</sup> It is clear, as Dewey himself had admitted, "that acquaintance with Hegel has left a permanent deposit in my thinking."<sup>47</sup>

Dewey once said :

Modern life involves the deification of the here and the now ; of the specific, the particular, the unique, that which happens once and has no measure of value save such as it begins with itself. Such deification is monstrous fetichism, unless the deity be there ; unless the universal lives, moves, and has its being in experience as individualized.<sup>48</sup>

From this individualistic stance he came to define democracy as "primarily a mode of associated living, of conjoint communicated experience."<sup>49</sup> In the chapter entitled "Education and Growth" in *Democracy and Education*, he said that "There is always a danger that increased personal independence will decrease the social capacity of an individual."<sup>50</sup> The entire

book is an apotheosis of scientific and experimental method of teaching and learning which must be carried on through meaningful activities. Education must lead to growth which, *mutatis mutandis*, means ultimately to be able to become a fruitful member of society. As he observed in the concluding chapter of the book :

...the measure of the worth of the administration, curriculum, and the methods of instruction of the school is the extent to which they are animated by a social spirit...To maintain such education is the essence of morals.

Indeed, for Dewey, "The moral and the social quality of conduct are, in the last analysis, identical with one another."<sup>51</sup>

Dewey was a prophet of the religion of democracy and science. A passage invokes democracy with an almost millenarian fervor :

And when the emotional force, the mystic force one might say, of communication, of the miracle of shared life and shared experience is spontaneously felt, the hardness and crudeness of contemporary life will be bathed in the light that never was on land and sea.<sup>52</sup>

He also truly believed that scientific methods ought to be applied to every aspect of democratic man's life. Thus he declared :

Seen in the long perspective of the future, the whole of European history is a provincial episode. I do not expect to see in my day a genuine...integration of thought. But a mind that is not too egoistically impatient can have faith that his unification will issue in its season. Meantime a chief task of...philosophers is to...make straight and open the paths that lead to the future. Forty years spent in wandering in a wilderness like that of the present is not a sad fate—unless one attempts to make himself believe that the wilderness is after all itself the promised land.<sup>53</sup>

*Art as Experience* marks the culmination of a theme formulated earlier in *Experience and Nature* that art "is the complete culmination of nature" and that science is "properly a handmaiden that conducts events to this happy issue"<sup>54</sup> Now Dewey appears to interpret all life as one grand aesthetic totality and to find in art the *salvation* of mankind. The book frequently refers to this great harmonious whole, this wonderful "religious feeling", which "raises to great clarity" the "sense of an enveloping undefined whole", when egotism is absent, thus enabling us to become "the citizens of this vast world beyond ourselves".<sup>55</sup> Science and art have coalesced ; man and nature have become one, man being

nature become intelligent. Yet, in reality, man is still but a "ganglion within" the superb nerve structure of the universe. This concept of the superiority of mother nature is poetic pantheism which had greatly influenced the English Romanticists like Keats and Shelley. Their impact is unmistakably seen on Dewey. In fact, the second chapter of *Art as Experience* is entitled "The Live Creatures and 'Ethereal Things'" with a footnote quoting Keats: "The Sun, the Moon, the Earth and its contents, material to form greater things, that is, ethereal things—greater things than the Creator himself made"<sup>66</sup> Man's wonderful existence and his ascendancy to "unprecedented heights" will commence when the "Oppositions of mind and body, soul and matter, spirit and flesh" will dissolve and a "unity of sense and impulse, of brain and eye and ear,... exemplified in animal life" will be achieved "saturating it with the 'conscious meanings derived from communication and deliberate expression.'"<sup>67</sup> Art will be the main vehicle through which human life will thus be elevated. Thus will art usher in the kingdom of heaven on this earth through a "transfiguration" of appetites and "transformation" of emotions.<sup>68</sup>

Of course, Dewey did not deny the role of science and scientific methods altogether. For him

...faith in the possibilities of continued and rigorous inquiry does not limit access to truth to any channel or scheme of things. It does not first say that truth is universal, and then add there is but one road to it. It does not depend for assurance upon subjection to any dogma or item of doctrine. It trusts that the natural interactions between man and his environment will breed more intelligence and generate more knowledge provided the scientific methods that define intelligence in operation are pushed further into the mysteries of the world, being themselves promoted and improved in the operation. There is such a thing as faith in intelligence becoming religious in quality...<sup>69</sup>

It was perhaps more than a mere coincidence that Dewey's *Art as Experience* and *A Common Faith* appeared in the same year. The poetic pantheism of the former and the "natural piety" or the "common faith" of the latter do reveal a profoundly humanistic and mystical attitude that indeed was elevated to the level of a religious consciousness.

## VII

It has been sufficiently clear by now that both Rousseau and Dewey were romantic and pantheist in varying degrees. Such a comparison, or (to an ultra-Deweyan) a *tour de force*, however, is caused neither for

disdain nor for charity to John Dewey. Both Rousseau and Dewey were great humanitarians, and both sought, within the social, political, and cultural framework of their time, to provide panacea for human problems. Doubtless Rousseau, the lonely tormented intellectual, suffered from a tremendous sense of wrong committed by his society and thus he had harked back to the primitive bliss of Arcadia as well as sought to build up his ideal society in the *Social Contract*. Dewey, on the other hand, inspired by the euphoria of industrialization of the Western world, especially in his own country, and attracted by the cornucopia of material prosperity which science in his day had unmistakably promised, saw in science the ideal method for the advancement of democracy. He had profound love for his society and his education was designed to produce citizens worthy of living in this society and enriching it further. He was convinced that

When the school introduces and trains each child of society into membership within such a little community, saturating him with the spirit of science, and providing him with the instruments of effective self-direction, we shall have the deepest and best guarantee of a larger society which is worthy, lovely, and harmonious.<sup>60</sup>

Ultimately, however, in a mystical way, science, nature, man, and art fused together, and Dewey declared in 1934 :

We are no longer compelled to choose between explaining away what is distinctive in man through reducing him to another form of a mechanical model and the doctrine that something literally supernatural marks him off from nature. The less mechanical—in its older sense—physical nature is found to be, the closer is man to nature.<sup>61</sup>

In one sense, Dewey represents unmistakably the authentic Western tradition of scientific development. As Professor Lynn White Jr. has observed, "The modern positivist is a man of faith as much as was the medieval mystic."<sup>62</sup> As early as the twelfth century the Western man had begun to pay attention to the physical world. In the thirteenth, St. Francis of Assisi "supplemented the doctrine that material things convey messages from God with the new idea that natural phenomena are important in themselves..."<sup>63</sup> Roger Bacon, a Franciscan friar, had said that there are two sources of knowledge of the mind of God—the Book of Scripture and the Book of Nature. Natural theology was thus an important foundation on which Western science is based. Almost every major scientist from c. 1250 to c. 1650, including such notables as Leibniz and Newton, considered himself also a theologian. Changes in science in the past were related to changes in basic religious attitudes, in

aesthetic perceptions, and in social relationships. The important point to underscore here is that science and religion (as part of human activity) were not really incompatible in the history of Western culture. John Dewey stands firmly and squarely on this tradition. More appropriately, he was, like Karl Marx before him, the true inheritor of the legacy of spiritual humanistic tradition of the West. Like-Marx, Dewey, in his own way, truly "represented the Western tradition in its best features : its faith in reason and in the progress of man."<sup>64</sup>

Both Rousseau and Dewey were truly the seminal minds of the West whose influences abound all over the world. But unfortunately, both came to politicize the educational processes and thus, unknowingly or unwittingly, reduced education to a mere manipulation or a technique. Indeed, as an educator has recently argued, teaching and learning are "an existential experience, one that cannot be reduced to technique."<sup>65</sup>

Nevertheless, Dewey, more than his illustrious predecessor, will remain a phenomenon not only in the history of the American education, but more surely, in the history of the educational reforms of many other countries. Even in the United States, where the progressive movement, to which Deweyan philosophy contributed significantly, has apparently died, many of Dewey's premises of education have been recently restated and reformulated by the leaders of the so-called reform movements raging currently.<sup>66</sup> No matter how inconsistent he was, Dewey in his own mind had grown from truth to truth. And the vision, coming out of this magnificent evolution of a magnificent mind, though hard to accept absolutely, will be harder to deny altogether. It would be indeed unfortunate to ignore the wisdom of a humanitarian whose overriding concern was, as a character in Terence's play put it : "*Homo sum, humani nihil a me alienum puto.*"

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\* An earlier version of this essay was presented by the writer in Professor C.A. Bowers' Seminar on the Reform Movements in Education in Winter Term 1974 at the University of Oregon. The writer gratefully acknowledges the helpful suggestions of Dr. Bowers. He also thanks Professor Earl Pomeroy of the department of history for having kindly read the finished version of this paper and for his criticisms.

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33. ROUSSEAU, *Social Contract* ed. Crocker, Chapter VIII In his *Considerations sur le Gouvernement de Pologne et sur sa Reformation Projete* (1771), written on the request of a Polish aristocrat, called the Comte de Wielhorski, Rousseau proposed that "It is the function of education to fashion the souls of the people according to the national pattern and to direct their opinions and tastes in such a way that they become through preference and necessity passionately patriotic" For Poland Rousseau did not recommend any change in the structure of society. He sought to preserve the structure of the aristocratic Polish Republic, but, in fact, he had upset everything by making virtue and merit the criteria of social differences. As one critic has justly remarked, "He was building the new city with all the fanaticism of a priest and the fantasy of a backyard inventor, and showing himself to be a forerunner of both Robespierre and Fourier." See Jean Guehenno, *Jean-Jacques Rousseau* tr. by John and Doreen Weightman, two volumes, Vol. II, London: Routledge & Kegan Paul, 1966, p. 262. See also pp. 259 ff
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# Influence of Language and Script on Affective Meaning

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*Whether languages are to be taught as curricular subjects or as media of instruction at various stages of education has long been a source of controversy. Linguists and educationists extend their arguments for and against one or the other language in the Indian situation. It is interesting to know the effect of (i) language (mother tongue and medium of instruction) and (ii) the script on the effective meaning of selected concepts.*

*Twelve sample concepts were selected so that they were similar both in pronunciation and meaning in two languages. Hindi and Kannada. These concepts represent political, literary, artistic, scientific, social, educational and religious aspects of Indian life. Two groups of bilingual and one group of trilingual subjects were selected from the high schools in Bangalore city. Each group consisted of 15-20 boys of ages 14-17 who were studying in Class X. A set of 12 Semantic Differential Scales in Hindi, Kannada and English were used to measure the effective meaning of concepts. The analysis of variance was computed to examine various hypotheses.*

*The study shows that by and large the mother-tongue and its script affect the meaning of concepts in any situation—educational or social more than a foreign language and its script. In other words, there is a tendency on the part of subjects to rate concepts more towards the positive side when presented in mother tongue with its script than when presented in the second and third languages with different scripts.*

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IN EDUCATION language has two roles to play: (i) a language is learnt as a subject, and (ii) it is used to learn a subject. Related to these two roles of language many queries are made. Regarding the first role of language, it is generally asked whether the learning of language is only learning of speech or it includes the script also. Sometimes, one script for so many languages suggested. But the speakers of a language having the script normally do not accept this suggestion. But why? Is it only an emotional reaction or it is reasonably psychological? Similarly, controversies regarding the medium of instruction prevail. According to one group of opinions, mother-tongue of the child is the best medium of instructions, even if it is not a developed language. Others feel that the medium of instruction should be a developed language—it may be a foreign language if the mother-tongue of the child is not so well developed. Still others are of the view that in view of the contemporary cosmopolitan culture an international language should be the medium of instruction. Besides other points of view, viz. national, political, cultural, personal, social and economic, etc., the issue should be viewed vis-a-vis the attitude of students towards a particular language or script. It can be investigated by studying the affective meaning of the same concepts in different languages and scripts by mono-lingual, bi-lingual and tri-lingual subjects. If differences in the affective meaning of the same concepts occur because of language and script variables, it may be due to the attitudes of the mono-lingual, bi-lingual and trilingual subjects towards the mother-tongue and its script vis-a-vis any other language and its script. Hence, in order to test this hypothesis, the study was conducted.

The study is based on the Representational Mediation Theory of Meaning<sup>1</sup> as propounded by Prof. Osgood. The Semantic Differential technique developed by the same author has been used to measure the attitudes of subjects towards languages and scripts. The S.D. technique refers to a procedure for evaluating or specifying the meaning of a concept or a word representing a stimulus or some other substantive by making ratings on a series of adjectival bipolar scales. Each scale consists of adjectives, regarded as opposites in meaning separated by seven spaces which permit a rating of the degree to which the concept manifests or is close to either of the adjectives.

The affective meaning of a sign as elaborated by Osgood (1953) is that "it is a conditioned, internalised (i.e. covert, not directly obser-

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1. Osgood identifies 'meaning' with Representational Mediation process which intervenes between the sign and variety of overt adaptive acts which take account of the signficte.

vable) reaction which represents the total behaviour that occurred to the thing signified under the environmental conditions existing when the sign was originally presented." Thus, variations in the affective meaning of words ultimately relate to the differences in experiences, in relation to the individual's previous encounters with specific words. According to Osgood, Evaluation, Potency and Activity (EPA) are universal features of human semantic systems. These EPA components of affective meaning as measured by Semantic Differential have been replicated in diverse situations under very rigorous conditions with over twenty-seven language-culture communities around the world.

### *Objective of the Study*

The study was conducted with the following objectives in view.

1. To see the effects of language (Mother-tongue and Medium of Instruction) on the Affective Meaning of selected concepts, and
2. to see the effect of different scripts on the Affective Meaning of selected concepts.

### *Hypothesis*

Since different scripts act as different physical stimuli for the bi-tri-lingual subjects, some differences may be expected in the meaning of the signs. Secondly, the second and third languages are learnt much later as compared to the another-tongue. Therefore, sign-significate association is obviously established late in the case of second or third language. It is quite reasonable to expect differences in the affective meaning of concepts when rated in mother-tongue and in the other language.

The following null hypotheses were formulated and tested.

- (a) There are no differences in the affective meaning (scores on E.P. and A) due to differences in mother-tongue when concepts are rated on scales in the other language.
- (b) There are no differences in the affective meaning (E.P. and A scores) of concepts when they are rated on scales in the mother-tongue of one group.
- (c) There are no differences in the affective meaning (scores on E.P. and A) due to differences in script of concepts and scales.

*Selection of Concepts.* Twelve sample concepts were selected so that they were similar both in pronunciation and meaning in two Indian languages : Hindi and Kannada. These concepts represent political, literary, artistic, scientific, social, educational and religious aspects of culture. The list of concepts is given below.

ENGLISH TRANSLATION EQUIVALENTS

1. King (राजा) 2. Country (देश) 3. Prose (गद्य) 4. Dance (नृत्य)  
5. Song (गीत) 6. Electricity (विद्युत्) 7. Wife (पत्नी) 8. Marriage (विवाह)  
9. Teacher (शिक्षक) 10. School (विद्यालय) 11. God (भगवान) (12. Religion  
(धर्म).

*Selection of Subjects.* Two groups (A and B) of bi-lingual subjects and one group (C) of tri-lingual subjects were selected from three high schools of Bangalore city. Each group consisting of 15-20 boys of ages 14-17 who were studying in X grade, rated the above concepts. Table 1 shows the number and types of subjects in each of the three groups.

Table 1  
BI-LINGUAL AND TRI-LINGUAL SUBJECTS

Group	Type of subjects	Number of Subjects
A.	Bilingual : Kannada + English	20
B.	Trilingual : Kannada + English + Hindi	15
C.	Bilingual : Hindi + English	19

*S.D. Scales.* The rating of concepts was made on 12-scale semantic differential scales (pan-cultural) in Delhi-Hindi, Mysore-Kannada and American-English. These scales represented three dominant factors of the "pan-cultural" factor analysis with four scales for each dimension. The scales in each of the three languages are shown in Table 2.

Table 2  
PAN-CULTURAL SCALES\*

	Factor I -32% Evaluation		Factor II-7.2% Potency		Factor III-5.1% Activity	
AMERICAN ENGLISH	Nice	—Awful	Big	—Little	Fast	—Slow
	Good	—Bad	Powerful	—Powerless	Alive	—Dead
	Sweet	—Sour	Strong	—Weak	Noisy	—Quiet
	Helpful	—Unhelpful	Deep	—Shallow	Young	—Old
DELHI HINDI	Good	—Bad	Brave	—Cowardly	Fickle	—Serious
	Glad	—Angry	Heavy	—Light	Soft	—Hard
	Superior	—Inferior	Fast	—Slow	Thin	—Thick
	Nectar- Like	—Poisonous	Difficult	—Easy	Perfect	—Imperfect
MYSORE KANNADA	Merciful	—Cruel	Big	—Small	Active	—Dull
	Good	—Bad	Wonderful	—Ordinary	Unstable	—Stable
	Calm	—Frightful	Huge	—Small	Loose	—Tight
	Delicate	—Rough	Great	—Little	Fast	—Slow

\* Pan-Cultural Semantic Differentials were developed in different language culture groups by the Centre for Comparative Psycholinguistic Institute of Communications Research, University of Illinois, U.S.A.

*Data Collection*

Each subject was supplied a test booklet which consisted of the following three parts.

PART I. It comprised 12 sheets, each having Kannada SD scales with a concept at the top. The scales and concepts were printed in Kannada script.

PART II. It comprised 12 sheets, each having 12 Hindi SD Scales with a concept at the top. The scales and concepts were printed in Devnagari script.

PART III. It comprised 12 sheets, each having 12 English SD scales with a concept (translation equivalent) at the top. The scales and concepts were printed in Roman script.

Thus, each booklet consisted of scales in Kannada followed by scales in Hindi and then scales in English. The ordering of scales and their ends were matched in all the three parts of the booklets.

The order of the presentation of concepts was reversed in half of the total number of booklets. Each group of subjects was supplied with these booklets and subjects were asked to rate the concepts against scales in as many languages as possible (the maximum being three languages : Hindi, Kannada and English).

Thus the data was gathered from different groups of subjects as shown in Table 3.

Table 3

S. No.	Group	N.	Data Code	Subjects Variables Included		
				Mother-Tongue	Medium of Instruction	Scripts
1.	A1	20	KKK	Kannada	Kannada	Kannada
2.	A2	20	KKE	Kannada	Kannada	English
3.	B3	15	KEK	Kannada	English	Kannada
4.	B4	15	KEH	Kannada	English	Hindi
5.	B5	15	KEE	Kannada	English	English
6.	C6	19	KEH	Hindi	English	Hindi
7.	C7	19	HEE	Hindi	English	English

*Analysis*

(a) *Effect of mother-tongue (K, H) on E.* The analysis of variance was computed to examine the hypothesis of no mother-tongue effect on scores for Evaluation, Potency and Activity dimensions of the

affective meaning. The effects are examined for Kannada and Hindi on English. The results of analysis are presented in Table 4.

**Table 4**  
**ANALYSIS OF VARIANCE OF SCORES ON ENGLISH SCALES**

Group	Sources	df	F	Value on Dependent Variables			F <sub>.95</sub>	F <sub>.99</sub>
				Evaluation	Potency	Activity		
A2	Mother-Tongue (K,H)	I	2.296	10.077**	28.645**	4.84	9.65	
VS	Concept	II	4.435**	7.470**	1.395**	1.91	2.47	
C7	MTX Concept	II	1.961	0.785	0.683	1.91	2.47	
B5	Mother-Tongue (K, H)	I	8.827*	12.242**	3.861	4.84	9.65	
VS	Concept	II	4.746**	3.976	2.582**	1.91	2.47	
C7	MTX Concept	II	1.496	1.017	0.989*	1.91	2.47	

\* Significant at 5% level.

\*\*Significant at 1% level.

By comparing the groups A2 and C1 having different mother-tongue (K) and (H) respectively and the medium of instruction also different, (K) and (E) respectively, we find that if the concepts and scales are presented in English language and its script, the potency (10.077)\*\* and the Activity (28.645)\*\* dimensions of the affective meaning are effected. By comparing the groups B5 and C7 having different mother-tongues, (K) and (H) respectively, but the same medium of instruction (E), we find that if the concepts and scales are presented in English language and its script the Evaluation (8.827)\* and the Potency (12.242)\*\* dimensions of the affective meaning are effected. However, in both the situations with mother-tongue different than the language and script of the concepts and scale, the affective meaning of concepts is effected, in the first case evaluation is not effected and in the second the activity. Out of 6 items of variance 3 are significant at 1 per cent level and 1 at 5 per cent level.

*Effect of Mother-Tongue (K, H) on H.* The analysis of variance was computed to examine the hypothesis of no mother-tongue effect on scores for Evaluation, Potency and Activity on Hindi scales. The results of analysis are presented in Table 5.



**Table 5**  
**ANALYSIS OF VARIANCE OF SCORES ON HINDI SCALES**

Group	Source	df	F	Value of Dependent Variables			F.95	F.99
				Evaluation	Potency	Activity		
B4	Mother-Tongue (K, H)	I	30.444**	4.511	6.200**	4.84	9.65	
VS	Concept	II	2.422**	1.617	1.829	1.86	22.40	
C6	Mother-Tongue*	II	0.783	1.519	1.187	1.863	2.40	
	Concept							

\* Significant at 5% level.

\*\*Significant at 1% level.

By comparing the groups B4 and C6, having different mother-tongue (K) and (H) respectively and the same medium of instruction (E), it is observed that if the concepts and scales are presented in Hindi language and its script the Evaluation (30.444)\*\* and the Activity (6.200)\* dimensions of the affective meaning are effected. Thus, it can be said, that if the mother-tongue of the subject is different from the language of the concept and scales (E or H) the affective meaning of the concepts is effected irrespective of the similarity or difference of the medium of instruction of the subjects. Moreover, the magnitude and the direction of the effect of M.T. script increases considerably on the Evaluation and the Activity dimensions.

Of course, the effected dimensions of the affective meaning of concepts are different in different situations but it can be reliably said that in all the situations the mother-tongue affects the meaning of concept. Therefore, the hypothesis of no mother-tongue effect is rejected.

*Effect of script.* An analysis of variance was computed to examine the hypothesis of no-script-effect separately for the scores on Evaluation, Potency and Activity dimensions of the affective meaning. The results of the analysis of variance are presented in Table 6.

**Table 6**  
**ANALYSIS OF VARIANCE**

Source		Df	F-ratio on Dependent Variables				
(KK Vs. KH)						F.95	F.99
A1	B4		Evaluation	Potency	Activity		
Script		I	10.16**	5.16*	.47	4.84	9.65
Concept		II	.79	1.43	.93	1.87	2.40
Script X Concept		II	.66	1.31	1.31	1.87	2.40

\* Significant at 1% level.

\*\*Significant at 5% level.

By comparing the groups A1 and B4 having the same mother-tongue (K) we find that if the concepts and scales are presented in Kannada and Devnagriscripts respectively the scripts affect the scores on Evaluation and Potency dimensions but not on the Activity dimension. The effect is greater when the script of the mother-tongue is used. Therefore, it can be safely ascertained that there is tendency among subjects to rate concepts more towards the positive end on Evaluation dimension when presented in the script of their mother-tongue than when presented in the script of second or third language. The magnitude and direction of the effect of the script of mother tongue increases on Evaluation and Activity dimensions.

### *Discussion of Results*

We learn a language and also it is used as medium in education and daily life. But in all these situations communication is the main purpose. In communication—verbal and written—language and its script play an important role. For perfect communication, both of its facets—informative and affective—should be integrated and depicted satisfactorily. Information is less effectively communicated if the affective aspect of communication is not good, strong and active. If the encoding S is bad, weak and inactive, the decoding response also is such, resulting in unsatisfactory interaction in communication in any of the above-mentioned situations.

As is clear from the results of the study, if the concepts as S are presented before the subjects in their mother-tongue and its script, the affective response of the subjects goes up significantly in the positive direction on Evaluation, Potency and Activity dimensions of the meaning, of course, on different dimensions in different situations. It is important to note that both language and scripts are important for affective communication, which is very important whether we communicate for information or to motivate and elicit behaviour. Moreover, it is more important if we want to use communication to move the people. The affective aspect of communication is intimately related with the attitude of the people. The study shows that the behavioural non-acceptance of the script of a foreign language for a language which already has a script of its own and of a foreign language as medium of instruction is reasonably psychological. In other words, the mother-tongue and its script provide more effective communication in any of the situation, educational or social, than any foreign language or script. However, the study shows only the trends and emphasizes the need of detailed study to find out specific reply to many queries like the following.

1. By using a language and script other than the mother-tongue which concepts are affected most in their affective meaning and to which aspect of life are they related ?

2. By using a language and scripts other than the mother-tongue which concepts are affected least in their affective meaning and to which aspect of life are they related ?
3. On which dimensions of the affective meaning what concepts are affected most and to which aspect of life are they related ?
4. On which dimensions of the affective meaning what concepts are affected least and to which aspect of life are they related ?
5. Does the change of the affective meaning of concepts depend upon the *correspondence between the mother tongue and its script* ?

It is expected that the reply to such queries may help us in looking into the administrative and academic problems such as adopting the script for another language, the use of language as medium of instruction and other types of communication and accepting one language for the whole country more subjectively and reliably.

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# Similarities in the Economic Ideas of Sismondi and Gandhi

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GANDHI AND SISMONDI conformed to each other in economic thinking on certain issues. One point of similarity between the economic ideas of both of them is found in the concept they had towards the 'science of economics'. They accepted economics as the science of human welfare. Modern economists also recognise the welfare aspect. According to Prof. Samuelson, "Economics is the study of how men and society choose, with or without the use of money to employ scarce productive resources to produce various commodities over time and *distribute them for consumption* now and in future among various people and groups in society."<sup>1</sup>

Sismondi was the first economist who advocated the ideal of human welfare for economics. Later, it became one of the bases of neo-classicism. According to Sismondi, human welfare is the real wealth of a nation and increase in human welfare makes a nation prosperous. In fact, unlike the classical economists, the actual and ultimate aim of economics in Sismondi's view is the human welfare and not the maximization of material wealth. Bertrand Russel holds the same view :

In judging of an industrial system whether the one under which he lives or one proposed by reformers, there are four tests which may be applied. We may consider whether the system secures (i) the

maximum of production, (ii) justice in distribution or (iii) a tolerable existence for producers or (iv) the greatest possible freedom and stimulus to vitality and progress. We may say broadly, that the present system aims only at the first of these objects, while socialism at the second and third. Some defenders of the present system contend that technical progress is better promoted by private enterprise than it would be if industry were in the hands of the state; to this extent they recognise the fourth of the objects we have enumerated. But they recognise it only on the side of the goods and the capitalist, not on the side of wage-earner. I believe that the fourth is the most important of the objects to be aimed at, that the present system is fatal to it and that orthodox socialism might well prove equally fatal.<sup>2</sup>

It shows that the maximization of human welfare is not possible under extreme conditions either of laissez-faire or of socialism, it needs a mid-way.

Sismondi was of the same view. He advocated national happiness as the aim of economics. Honey remarks : "The economists had taught how to increase national wealth. He would treat how to increase national happiness and to this end he would point out the advantages of Government intervention to regulate the progress of wealth."<sup>3</sup>

Gandhi expressed his views in a similar way .

What is really desired under the name of riches is, essentially, power over men; in its simplest sense, the power of obtaining for our own advantage the labour of servant, tradesman and artist. So that the art of becoming 'rich' in the common sense is not only the art of accumulating much money for ourselves but also of contriving that our neighbour shall have less. In accurate terms it is the art of establishing the maximum inequality in our own favour. Since the essence of wealth consists in power over men, will it not follow that the nobler and the more in number the persons are over whom it has power, the greater the wealth. Perhaps it may even appear after some consideration that the persons themselves are the wealth; not gold and silver. The true veins of wealth are purple—and not in Rock but in flesh. The final consumption of all wealth is in producing as many as possible—full breasted, bright-eyed and happy hearted human beings.<sup>4</sup>

Gandhi like the great French economist Sismondi regarded economics and ethics indissolubly linked together. He did not stand for the

old policy of free trade but favoured planning for a rational and balanced economy.

Both Sismondi and Gandhi were opposed to indiscriminate multiplication of machinery. Sismondi saw no justice in the increased use of machinery in as much as it would lead to unemployment and reduction in wages. He did not totally discard the use of machines. He held that the use of machinery should be made so long as it might not displace labour and create conditions of unemployment :

His real point is that invention and the introductions of machinery are an unmixed benefit only when preceded by an increase in revenue and demand which would allow the employment elsewhere of the labour which is displaced otherwise there is suffering through lower wages and unemployment.<sup>5</sup>

The immediate effect of machinery is to throw some of the workers out of employment to increase the competition of others and so to lower the wages of all. This results in diminished consumption and a slackening of demand. Far from being always beneficial, machinery produces useful results only when its introduction is preceded by an increased revenue, and consequently by the possibility of giving new work to those displaced. No one will deny the advantage of substituting a machinery for a man, provided that man can obtain employment elsewhere.<sup>6</sup>

Gandhi held the following view towards the use of machinery : "I would welcome every improvement in the cottage machines, but I know that it is criminal to displace hand labour by the introduction of power-driven spindles unless one is at the same time ready to give millions of farmers some other occupation in their homes".<sup>7</sup> At one place in *Harjan* (16. 11. 34) Gandhi had mentioned that machines are good when the supply of labour is short, but these are bad if the supply of labour is more than required. Thus the use of machinery is improper if it leads to unemployment. He has stated clearly,

The spinning wheel itself is a machine, little tooth prick is a machine. What I object to is the craze for labour-saving machinery. Men go on saving labour till thousands are without work and thrown on the open streets to die of starvation. I want to save time and labour not for a fraction of mankind but for all.<sup>8</sup>

Sismondi was also critical of competition. He upheld it to the extent it led to an increase in production to meet the increasing demand.

Under the condition of stationary demand and fixed level of consumption if the producers compete with each other for the purpose of capturing the market it becomes a social evil. Such competition leads to the reduction of money costs by enhancing working hours, reducing wages, employing women and children, intensifying and adopting rationalization techniques, thereby raising the human cost. The view of Sismondi runs :

The earnings of an entrepreneur sometimes represent nothing but the spoliation of the workers. A Profit is made not because the industry produces much more than it costs, but because it fails to give to the workmen sufficient compensation for his toil. Such an industry is a social evil.<sup>9</sup>

Further, Sismondi holds : "....modern society lives at the expense of the proletariat, seeing that it curtails the reward of his toil."<sup>10</sup> Elsewhere he writes : "Spoliation indeed we have, for do we not find the rich robbing the poor ? They draw in their revenues from the fertile easily cultivated fields and wallow in wealth, which the cultivator who creates that wealth is dying of hunger, never allowed to enjoy any of it."<sup>11</sup>

When Sismondi talks of robbing the worker he only means that sometimes insufficient payment is made to the worker, that is, he does not always get payment sufficient for his livelihood. He does not think that the appropriation of a part of the social product by the proprietors or capitalists is unjust. Sismondi says, "The poor man, by his labour and his respect for the property of others, acquires a right to his home, to warm, proper clothing, to ample nourishment sufficiently varied to maintain health and strength...only when all these things have been secured to the poor as the frint of their labour does the claim of the rich come in. What is superfluous, after supplying the needs of everyone, that should constitute the revenue of opulence."<sup>12</sup> Here the sense in which the term 'spoliation' is used is clear.

From the views of Sismondi it is evident that the large scale industry does not think of just distribution. Competition creates two classes in the society—the rich and the poor—and the former exploits the latter.

Likewise, according to Gandhi, "City people may be getting big profits and good wages but all that has become possible by sucking the blood of villagers"<sup>13</sup> Further, he expressed : "Distribution can be equalised when production is localised, in other words, when the distribution is simultaneous with production. Distribution will never be equal so long as you want to tap other markets of the world to dispose of your goods".<sup>14</sup>

Under his reform projects, Sismondi wanted that cottage and small-

scale industries should be encouraged instead of the large-scale industries. He did not want to allow the conditions to lead to over-production. Like Sismondi, Gandhi too wanted industrialization through small-scale and cottage industries, as large-scale production leads to the concentration of power and riches in a few hands, resulting in inequality in the distribution of income and increased unemployment, misery and poverty. It would also lead to over-production and under-production. He, thus, devised the mechanism of simultaneous production and consumption.

Finally, we may say that both Sismondi and Gandhi favoured the development of domestic industries with a view to establishing an equilibrium between production and consumption. Besides, both of them believed in peaceful and humanitarian methods of solving economic problems and for this, they do not feel the necessity of abolishing the capitalists.

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# Misanthropy and Value

## A Study of Medical College Work Culture\*

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*Faith in people as a variable may be relevant to work attitude and behaviour. There is reason to believe that the individual's view of humanity may influence his reactions to a wide range of his work values. There is, thus, reason to expect the individual's degree of misanthropy to influence his perception of work and his behaviour towards work. Here, faith in people is treated as a generalized attitude. By definition, work value would mean the worth or excellence or the degree of worth, ascribed to a particular work, activity or an aspect of the work (English and English 1958). Rosenberg (1957) views misanthropy in people as the basic "attitude toward human nature". Individual's behaviour may be influenced by a number of different factors, his inter-personal relationship, group affiliation, conditions of existence, personality characteristics, etc. There has been a tendency, however, to overlook the fact that "attitude towards human nature" may also have some bearing on human acts and consequently affecting his work values. There are several reasons for expecting misanthropy to be implicated in individual work - (1) individual ideologies often contain implicit assumptions about work; (2) since a behavioural system basically involves people in action, the individual's view of human nature is likely to be linked to his evaluation of how well the system actually works; and (3) the individual's stand on certain specific behavioural questions may be influenced by his assumptions about the nature of work. In other words faith in people may be associated with principles, practices and policies related to work.*

*In the present study an attempt has been made to find out relationship between work value and misanthropy among medical college students. Rao (1971) has studied relationship between professional socialization and institutional environment among final year medical students. But this is to study the work value and misanthropy in developmental perspective.*

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## METHOD

*Sample.* One hundred and twelve students studying in 1st year M.B.B.S. (28), 2nd year M.B.B.S. (29) and 3rd year (or final year) M.B.B.S. (55) were randomly selected from a medical college in Rajasthan.

*Instruments.* Two instruments were used for this study: Physician's work value inventory (Rao 1973) and F.M.A. Scale (Mehta 1973). Physician's work value inventory consists of ten values. (1) academic, (2) creativity, (3) economic, (4) independence, (5) security, (6) social (where the doctor values his being useful to others and to do service to suffering people and the needy), (7) status (status and prestige and a need to be respected by others), (8) rural (where the doctor values to work in a rural area with the same kind of environment), (9) work-conditions, and (10) co-workers (good relations and friendship with co-workers, supervisors and subordinates).

The method of paired comparisons was used in scaling the value preferences of the respondent. This method was preferred to the ranking method in order to get more accurate quantifications of the values and to find out the inter-correlations between different value dimensions with greater accuracy. Although using this method requires only one item for each value to be measured, a number of items parallel or similar in content were used in order to eliminate the monotony of respondents while making the required 45 comparisons. The instructions required to give more marks to the work-item he actually prefers when he takes up a job. The respondent is required to distribute 3 marks to the two items in each of the 45 pairs. As such each value is paired with 9 other values, the maximum possible scores is 27, and minimum possible score is 0 for each value. Total score of a respondent on each work value dimension is the sum of his 9 scores on the items or that value which occurs in 9 comparisons. Thus, on each value the score of the respondent will range from 0 to 27, the total of the 10 work value scores will always be 135 (Rao 1973).

The misanthropy scale used in the present research was developed by Mehta (1975). The scale consists of six items. The responses are given on a five-point scale ranging from strongly agree through strongly disagree (see Appendix). The development and standardization of this scale is reported in full by Mehta (1975). Rao (1975) in a subsequent study with school boys used this scale and found it highly reliable. Both the K.R. 20 and the split-half reliability were found to be satisfactory that is, K.R. 20 was .631 and split-half reliability coefficient was .682. The item analysis provided an index of internal consistency and of item validity as far as its power to discriminate respon-

dents on the basis of the strength of particular response was concerned. Intercorrelation found to be  $-0.244$ .

### RESULTS AND DISCUSSIONS

Table 1 shows that the mean score on misanthropy was 16.00 and S.D. 3.45. The mean score on the fifth item was the highest and also at the same time variation was also high as compared to other items. Lowest score was on the sixth item and the standard deviation was also low. This means that the medical students exceed the midpoint of nearly all the variables but they were lower on work value which means, students who perceived their work value positively, were negative on misanthropy scale (Table 2). Medical students have low faith in people and also have little respect for people. They were doubtful about freedom of speech. They had larger number of responses.

Table 1  
ITEM-WISE MEAN AND STANDARD DEVIATION OF F.M.A. SCALE

Items	Mean	S.D.
1	2.18	1.24
2	3.00	1.06
3	2.69	1.06
4	2.91	1.19
5	3.42	1.19
6	1.79	0.85
Total score	16.00	3.45

The profile emerging out of Table 2 indicates that medical students value social service most (16.95) followed by creativity (15.86) and independence (15.33). Status (14.41) value comes next in order followed by work in rural area (13.54), work-conditions (12.35), academic (11.88), good colleagues (12.17), security (11.56) and lastly the economic value. The trend in medical students is in some way similar to those indicated by Rao (1972) and others. The highest score obtained by these students on social service and creative value is in line with the nature of profession which is inherently service oriented. Studies by Srinivas (1958), Rezler (1963), Govindarajacharyala (1968), Rai and Pestonjee (1969-70), Pestonjee and Akhtar (1969, 1969a), Vasanta (1972) and Rao (1972) indicated to a high value assigned by different samples on this dimension. The medical students in this sample seem to have preference for independence. Most studies on Indian subjects conducted on this aspect have been contradictory in this regard. The least preferred economic value of this sample although appears surprising and contradictory to observations made by investigators like Reddy and Parameswaran (1966).

The dimension of academic value as measured in this study has only little to do with A.V.L. dimension of theoretical value and cannot be treated as synonymous. Academic value is treated here only as interest in teaching and for research work. Most of them prefer to put up private practice and use their training fruitfully. Their high score on status value is also in line with the results of the other Indian studies indicating the relatively high preference shown by our students to prestige and status (Razler 1963, Dhar 1965, Pestonjee, Akhtar and Chowdhary 1967, Rai and Pestonjee 1969-70, Pestonjee and Akhtar 1969, Vasanta 1972 and Rao 1972). Their low scores on the rural value are also indicative of their negative attitude to work in rural areas. Their preference to work in academic line is rather interesting. The low value attached by the medical students of this study to academic value is in sharp contrast with the American studies which consistently indicate medical students high on theoretical values (Hutchins 1962).

In India the medical profession has been viewed as a social service to humanity. Traditionally a physician is supposed to serve poor and needy without expecting any reward. The medical education of late has not been viewed as a discipline which imparts theoretical knowledge but develops skill of healing. Social service must always be the ideal of those who are involved in healing of sick and ailing. In the American society, on the other hand, with no such cultural heritage, medical education is a part theoretical concept development. With this cultural difference these results can be explained.

Table 2  
MEAN AND STANDARD DEVIATION OF VALUE SCORES

SI. No.	Variables	Mean	Standard Deviation
1.	Academic	11.88	4.42
2.	Creative	15.86	4.00
3.	Economic	10.71	4.18
4.	Independence	15.33	3.82
5.	Rural	13.54	4.14
6.	Security	11.56	3.53
7.	Social	16.95	4.06
8.	Status	14.41	3.25
9.	Work-conditions	12.35	3.33
10.	Co-workers	12.17	3.58

Table 3 shows intercorrelations among the misanthropy scale items and work-values. Item one (i.e. family planning is not going to benefit),

Table 3

## INTER-CORRELATION BETWEEN MISANTHROPY AND WORK-VALUE

Total On F.M.A.S	Items of F.M.A Scale						Aca- demic	Crea- tive	Eco- nomic	Inde- pen- dence	Rural	Secu- rity	Social Status	Work on di- tensions	Co work- ers
	1	2	3	4	5	6									
Total on F.M.A	X														
Item No. 1	0.582	X													
Item No. 2	505	177	X												
Item No. 3	370	152		X											
Item No. 4	523	174	024	021	X										
Item No. 5	475	064	206	092	202	X									
Item No. 6	445	215	060	097	063	070	X								
Academic	007	121	032	044	022	057	106	X							
Creative	054	078	086	015	001	012	357	182	X						
Economic	045	207	125	275	169	091	082	195	281	X					
Independence	086	012	108	023	026	000	209	324	126	195	X				
Rural	013	025	004	125	027	033	208	082	348	125	308	X			
Security	083	031	074	025	077	002	132	071	352	062	029	095	X		
Social	009	134	062	137	164	040	160	272	196	400	290	043	200	X	
Status	004	132	070	014	089	175	090	195	013	039	004	193	338	068	X
Work-condition	089	102	053	135	141	036	086	134	486	035	215	099	093	342	007 X
Co-workers	118	108	125	038	178	025	148	089	282	112	175	123	145	207	104 098

Decimal points have been omitted to save the space

Correlation values above .228 are significant at .01 level and those above .174 at .05 level.

shows high positive correlation with all the remaining five items. These correlations were in the expected direction. Further, Item 1 also showed high positive significant correlation with Item 6. The remaining correlations were, however, not significant but also showed a positive trend indicating homogeneity among items. Item No. 2 (i.e. bad person can never work with good person) showed a positive significant correlation with Item No. 3 (i.e. natural calamities alone can bring an end to our social problems). The status value also showed a positive correlation with Item 5 (western dress). Item 6 (i.e. it is difficult for the different religious groups to work together) showed a negative correlation with the creative value and the independence value and a positive correlation with the rural value. Thus, a creative person will be less reluctant to work with people belonging to other religions and did not like independence. But it showed a positive correlation with the rural value. The misanthropy scale stands for mistrust, lack of faith in people and worthlessness. The items in the scale were negatively termed. Therefore, the obtained correlations are in the expected direction. Except with a few items, however, some positive correlations were found.

It was found that the misanthropic respondents were more likely to be dubious (doubtful) about freedom of speech or to advocate its restriction, as compared to others. Since one cannot imagine of democracy without freedom of speech, without representative government or other civil rights, it appears that faith in people is clearly related to belief in the feasibility of the democratic form of Government. The person with low faith in people, irrespective of their own ideological positions tend to say that there ought to be low misanthropy score. It is interesting to observe that the philanthropists show a slight tendency to take refuge in the "undecided" response. The reason, probably, is that those with high faith in people feel the same way about the communist party as the misanthropes of the same political affiliation, but that they are reluctant to go so far as to advocate suppression. The individual with low faith in people tends to believe in suppression, irrespective of his political affiliation. But the misanthrope's tendency to suppress deviation groups is also reflected in his response to certain more general questions. Results indicate that the most misanthrope people were twice as likely as the least misanthropic to agree with this view. The misanthrope has a greater tendency to advocate the suppression of deviant people or groups.

On the primary level, the misanthrope may experience difficulty in establishing close, warm, bonds of friendship because of his basic distrust of, and contempt for, other people; on the second level, a misanthropic businessman may watch his employees and business associates "like a hawk", may abnormally worry about granting others credit, may interpret signs of friendliness as device of manipulation.

## APPENDIX

## F.M.A. Scale

1. Family Planning is not going to benefit the country in any way.
2. It is futile to hope from bad persons that they can ever work with good persons.
3. Natural calamities alone can bring an end to our social evils and personal quarrels.
4. We should not mix too much with each other as it produces the feeling of scorn.
5. The western mode of dressing may appear exciting, but I would not like that my family members be dressed so.
6. It is difficult for persons belonging to different religious groups to work together.

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- January 1976

# Book Reviews

## *Elementary Education in India : A Promise to Keep*

J. P. NAIK

Allied Publishers, New Delhi, pp. 98, 197

THE STATEMENT that education can cause economic development may be labelled as polemical by many. But they cannot refute the concomitance or interdependence of educational and national development. The assumption made in the present book that education can be engineered as one of the instruments of economic, social and cultural change therefore seems to be a non-controversial one. It is this assumption which pervades through all that has been suggested by the author in the 'Education Charter' given in the book.

One of the suggestions is that about one-third or one-half of the working time in all the educational institutions at all stages shall be devoted to active participation in the programmes of social service and national development which shall include a reasonable element of manual labour. This is indeed a valuable suggestion, for manual labour is not only a factor of production but is also an instrument of attitudinal change. If all of us can dig soil or lift materials with our own hands to build a road, a dam, a factory or an electric power station, we will be reducing the social and economic gap between the white and the blue collared workers. The other suggestions given in the 'Educational Charter' such as the provision of non-formal education for not less than six hours a week to all out-of-



school youth in the age-group 15-25, intensification of programmes of adult education and the liquidation of illiteracy within the span of a decade, etc. are all very meaningful in that they have a direct bearing upon improving the quality of life and the standard of living in the country.

The book as its title bears is mainly concerned with the elementary education. The first chapter is of a factual nature and presents data on enrolment in elementary schools and acquaints the reader with the enormity of the problem of fulfilling the constitutional directive on compulsory primary education. Subsequent chapters shed light on solving this problem. The main thesis of the author, and very rightly so, is that we could not succeed in universalizing the elementary education so far because we followed the traditional model for doing that. In the traditional model, the author asserts, economic development of the society preceded rather than followed the introduction of compulsory primary education for all. When a society achieved economic development, it could afford to open schools, appoint whole-time teachers, and have single-point entry, and sequential promotions. In India, because of our poverty, we cannot do all this. Our resources do not permit us to open schools of the existing type for all the children in the age group 6-14. If we have to provide education to all these children, as enshrined in the Indian Constitution, the existing concept of the school and the traditional model of education which supports it have to be modified. This is an important finding of the author.

In the search for new models, the author has examined many alternatives. He seems somewhat inclined to support the Gokhale-Parulekar model for its viability. The author candidly states: "It is a pity that the significance of this strategy is not realized even now. It would be no mean advantage to revert back to it and to emphasise the programme of liquidating mass illiteracy and the provision of effective universal education of four or five years only as a first stage in our programme and to complete the task successfully in five to ten years." Though this statement of the author may not be liked by many of us, yet we cannot give any cogent reasons to refute it. The author has also implicitly stated, and again very rightly, that a country as poor as ours cannot afford low teacher-pupil ratio or a single shift in our schools. He exhorts that in England, Germany, Switzerland, and almost all other western countries the teacher-pupil ratio in the beginning of the twentieth century was as high as 60 or 70. The author however concludes that this ratio, double shift system and four years of education in 3 R's is not acceptable to the middle class and the men in power, and he therefore passes on to discuss a second model known as 'Basic Education Model'. The reasons why basic education did not succeed have been very rightly analysed and pin-pointed by the author. The author has also described three other models: Rajgopalachari Experiment, the

Vinoba Model of One-hour School and the Education Commission Model. The main features of the Education Commission Model are described as the neighbourhood schools the work-experience programme (socially useful productive work based on science and technology), multiple entry, and part-time education. Insofar as the multiple-entry and part-time education are concerned, they do not face any significant social resistance. Work-experience can also be introduced, though with some difficulty. It is the concept of neighbourhood school which is in fact not acceptable to the elite who are used to send their children to public schools. The present reviewer feels that the middle class people are also not much interested in sending their children to a neighbourhood school, though they may often have to do so due to their limited income.

The last chapter of the book is a programme of action which flows from what has been discussed by the author in earlier chapters. The programme is really very concrete. The author who is a great educational statesman has done a great service to the country by formulating it.

It is hoped the book which, apart from its intrinsic merit, is an intellectual treat, will be read by people interested in or concerned with planning or education at school level.

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### *Mathematical Models for Educational Sector : A Survey*

Organization for Economic Co-operation and Development, Technical Report, Paris, pp. 298, 1973, \$ 6.00

*Mathematical Models for Educational Sector* is a technical report, based on a comprehensive questionnaire issued to the member countries. The report highlights the challenge of growing demand for education in terms of increased enrolment, the financial constraint, educational policies and decision making, etc. The survey has been carried out to review the work on model building, and serves the following purposes:

- (i) To have a comprehensive view of the current mathematical models for educational sector;
- (ii) to describe the main and general features of mathematical models used for education, and

- (iii) to measure how far the mathematical models have proved useful in solving the problems of education.

The models are presented systematically and scientifically through a classificatory scheme by flow-charts and tables. They can be understood by non-mathematicians, educational administrators and planners, etc. The material provided is not in the form of a manual or handbook, which could have been more useful. It would have been appreciated if a separate compilation was made of all the important models, with all the logarithm applied and empirical studies carried out.

The report is divided into two parts, one is the technical report, and the other comprises additional material supporting the report. The annexations contain the questionnaire, and the information concerning the models: *Title of the model*, respondent, location (country), the status of the work (finished or in progress) and type of the computer used, etc. after providing necessary codes to each model. The material in the annexations is so meaningfully presented that it can be cross-referenced.

In all there are 100 questions in the questionnaire. They may be broadly grouped under ten categories:

- (i) Type and structure of the model-variables and equations included; time horizon;
- (ii) Types and shapes of the equations and solution procedures;
- (iii) Mathematical programming models;
- (iv) Parameter estimation techniques used;
- (v) Special features of the models and the use of the results;
- (vi) Not covered by explicit models concerning student projections, teacher demand and supply projections etc.;
- (vii) Position of the working unit in the government organization;
- (viii) Relation of the working unit with other organizations and control of joint projects;
- (ix) Financing the project of non-government organization; and
- (x) External responsibilities of the Unit, internal structures, functions, organization and training.

Out of the reported 122 models, the work on 64 models have been completed, 54 models were described 'in progress' and only 4 models were at planning stage.

Out of the 30 problem-solving techniques of operation research, only 18 are considered as relevant to model-building in education. These are mentioned below in six major groups.

- (a) *Optimisation: Method:* (i) Linear programming; (ii) Non-linear programming; (iii) Linear dynamic programming.
- (b) *Analytical Method:* (iv) Simulation
- (c) *Mathematical Decision Theory:* (v) Functions; (vi) Matrices; (vii) Graphical analysis; (viii) Combinatorial analysis; (ix) Set theory; (x) Numerical analysis; (xi) Statistics; (xii) Probability theory; (xiii) Marginal analysis
- (d) *Analytical processes:* (xiv) Adaptive; (xv) Control; (xvi) Stochastic
- (e) *Theoretical Concepts:* (xvii) Information theory
- (f) *Management Games:* The applications of these techniques along with the illustrations have not been mentioned in the report. However, a comprehensive bibliography is given in the annexe. The research workers may find out further details.

The structure of the classification system is elucidated in five major terms, i.e. the models' characteristics, dimensions, categories, elements and attributes. These features are further classified into sub-groups and presented in a tabular form. The distribution is according to 67 models and belong to education system represented by itself, 37 models belong to education related to other sectors and 18 institutional models. The functional classification consists of 24 descriptive models, 57 forecasting models, 26 decision models and 15 simulation models. According to the mode of analysis, a further division of 5 models on theoretical and algebraical, 11 numerical and experimental, and 106 on numerical and applied has been made. Most of the models deal with forecasting and mode of analysis used is mostly numerical and applied and the major emphasis has been on higher education. There are 43 models on higher education and 20 models on primary and lower and upper secondary. The student variables shown in both the levels of education are, stock, flow and both stock and flow. Models have also been classified on other variables like, teacher, expenditure, capital, stock and cost.

The functional aspect of the models have been classified as descriptive, forecasting, decision and simulation. Descriptive model deals with the production of graduates, success rates and dropouts and demand for places. In forecasting models, enrolment forecasting, production of graduates, forecasting of costs and expenditure have been the important attributes. Decision model speaks about allocation of physical and financial resources, while simulation model, by and large concerned with the determination of the effect of alternative patterns of enrolment upon costs, expenditure and teacher requirements etc.

A classificatory system has also been developed, based on *a priori* nature, to classify the models on educational policy issues and their explicit purposes. The policy issues have been divided into three types, namely, policy, structural and other issues. In the same way, about 15 possible purposes have been broadly categorized as policy purposes, analysis purposes and special purposes. The matching of educational policy issues with the explicit purposes of these models has been done to see the gap between the issues and the models. A diagnostic study on each model of a country, in order to obtain a complete picture of policy issues and the use of the mathematical model, has not been possible due to the inadequacy of information.

A content analysis based on 'growth enquiry' of 5 selected countries, (United Kindom, Norway, the Netherlands, Federal Republic of Germany and United States) has been done. The educational areas demarcated for the purposes are.

- (i) Compulsory education;
- (ii) Education for the physically and socially disadvantaged;
- (iii) Permanent education ; and
- (iv) Innovation.

These tables are informative, but valid conclusions cannot be drawn from them. At best one can draw some inferences without subjecting them to any scientific test. Three types of case studies have been discussed in detail in Chapter VII of the report. The first case study contains a model from Norway for predicting educational enrolment and output in the post-secondary educational system. This model is a system of recursive equations. The forecasts based on this model have been accepted by their Government and are being used for estimating the future expenditures for universities and colleges. The second case study is "A model for the educational system of the Federal Republic of Germany" This is a simulation model and has been applied to the educational system of that country. The model covers a big span, ranging from the pre-primary level to the university level of education and shows their interdependence. The model deals with the supply of students per period, which flows into a teacher model, a space model and then into a financial model. The flow of student stocks is based on the demographic data and transition proportions, from which the requirement for space and teachers is found out, to be further used in financial model to have the educational budget. In the third case study, 9 models "with behavioural relations" of students have been described. The broad characteristics considered in them are:

- (i) Family and personal characteristics
- (ii) Other student characteristics

- (iii) Community characteristics
- (iv) School characteristics
- (v) Economic characteristics
- (vi) Miscellaneous.

The variables used in these models from the above-mentioned characteristics are listed separately under each model.

Finally, there cannot be any doubt about the importance and usefulness of these models in trying to solve some of the challenging problems of education.

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# The Concept of Equality in Education

## A Philosophical Investigation

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*The principle of equality, which is the basis of our national ideal of educational opportunities, only formally lays down rules for impartial consideration. But, being only a formal principle, it offers no help in determining the relevancy of grounds in any concrete case of the distribution of opportunities. This is to be determined by appealing to some higher principle or principles which can be sought by considering in detail the nature of the educational opportunities at stake.*

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CENTRAL to the concept of "equalization of educational opportunity", our national ideal, is the principle of equality. With controversies continuing to rage about the interpretation and the means of realization of equality of educational opportunity, a philosophical discussion of the concept of equality assumes more than topical interest. This paper presents an analysis of the concept of equality with particular reference to its meaning.

The idea of equality usually finds its expression in such assertions as "All men are equal", "All men are born equal", "All men are equal before God", etc. An analysis of such statements with respect to their meaning and to what they entail will perhaps help us clearly understand

the concept of equality. For the sake of simplicity, the statement "all men are equal" will be taken up for analysis. The analysis will equally (!) hold good, *mutatis mutandis*, for "all men are born equal" or any such assertion.

"All men are equal", it has been pointed out, if taken as an empirical generalization about the nature of man is either vacuous or patently false (Peters, 1966).<sup>1</sup>

It is vacuous because it does not specify in what respects men are equal. (Equality is a term which is used to compare men or things and men in some respects). If, however, the counts on which men are presumed to be equal, are specified, the statement is patently false. For with respect to any trait or quality we can think of—intelligence, attitude, interest, not to speak of physical characteristics like height, weight, colour of skin, etc.—men are manifestly different. If anything about man is obvious, it is his being different from other men

If experience so violently contradicts our belief that all men are equal, we must either seek a different interpretation of "all men are equal" or continue our search for a character or trait with respect to which our belief in the above generalization may be justified. Let us pursue our analysis a little further "Are the differences between men only apparent and superficial?" "Is there any quality that is common to all men and that constitutes, as it were, their essence?" "If so, in what does this essence of man consist?"

"All men are equal", it has been argued, not with respect to any particular trait or characteristic but in the sense of their sharing a common nature. Now, this amounts to saying that all men are equal because they all partake of the same "humanness", which is nothing but a devious way of saying that all men are equal because they are all men. Evidently, this is a trivial assertion and as an explanation it is singularly pointless. A further objection to this view (all men are equal in their all being men) is that being men is not a count on which men can, strictly speaking, be said to be equal (Williams, 1962).

"All men are human", although admitted as a tautology, is considered by some philosophers as a "useful" one. For, it is argued, that the statement serves "as a reminder that those who belong to the species *Homo-sapiens* are also alike in certain other respects more likely to be forgotten, for instance, the capacity to feel pain and affection for others" (Williams, 1962). To this it might be replied that what we are after in our analysis is some positive ground for our assertion that all men are equal and not the emotive value of a statement. The truth

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<sup>1</sup>All references to Peters, R.S. are to his work *Ethics and Education*, George Allen & Unwin Ltd., London, 1966 (1971 Edition pp. 117-143).

remains that to hold that all men are equal because they are all human is to hold to a tautology !

It is sometimes suggested that men do possess some common property, viz rationality and this makes them equal.<sup>2</sup> In reply to this it may be said that rationality is not an all-or-none affair. All men are rational, true. But equally true is the assertion that some men are *more* rational than other men and this immediately makes them unequal. The same argument applies for 'spirituality', setting aside for the moment the metaphysical nature of the concept. Be it rationality spirituality or any other property, it is obvious that men differ in degrees in which they possess that property and this makes them unequal (Peters).

"What might be meant, however, is that there are certain generic properties which men possess *qua* men which justify them all being treated *in this respect* differently from animals or angels" (Peters, *italics* author's). Such an argument, as Peters says, might of course provide grounds for treating men differently from animals or angels but it does not indicate how they should be treated. If, for instance, man's capacity for thought is singled out, it does not show why such capacity for thought should be respected, developed or ignored.

Before finally abandoning our search for positive grounds for asserting the equality of men, it would be worth-while if we consider a few other philosophical efforts to find such a ground. The famous Kantian injunction of treating every man as an end and never as a means only and his conception of man as a member of the Kingdom of Ends derive from the equality of men as moral agents (Korner). As moral agents, respect is owed equally to all unlike admiration which is commanded unequally by men in proportion to their unequal possession of different kinds of natural excellence. Respect is owed to him not because he possesses any empirical characteristic but solely for the transcendental characteristic of his being a free and rational will. Likewise the Christian conception of the respect owed equally to all men has its origin in the theological belief that all men are children of God. It is clear that both these views are metaphysical. In neither case is there anything empirical about man that constitutes the ground for equal respect.

It is also suggested that in certain "negative respects" like the capacity to suffer, the capacity to feel affection for others and a desire for self-respect, i.e. a desire to be identified with what one is doing (they are "negative" respects in that they involve men in moral relations as the recipients of certain kinds of treatment), men can be counted alike. It is

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<sup>2</sup>"Equality and Justice, the two great distinguishing characteristics of democracy, follow inevitably from the conception of men : all men as rational and spiritual being."—Robert M. Hutchins, *Democracy and Human Nature*.

further suggested that men are beings who are necessarily to some extent conscious of themselves and of the world they live in, though it is conceded that such consciousness is not possessed by them equally (Williams 1962). Since it is accepted that these various capacities, needs and consciousness are possessed in different degrees by men, this adds nothing new to our discussion.

Sometimes a distinction is made between human worth and merit (merit is taken to refer to all those valuable qualities or performances acquired by the individual and in respect of which persons may be graded and human worth to the intrinsic value attached to an individual) and it is argued that in respect of human worth all individuals are equal although in respect of merit they may be unequal. Further, human worth has been translated into the worth of an individual's well-being and freedom and it is held that one man's (*prima facie*) right to well-being and right to freedom are equal to that of any other. The equal worth of an individual's well-being and freedom is held to constitute the basis for all the human rights (Vlastos, 1962). About this view we might reiterate that what we are after in our search is some empirical basis for our assertion that all men are equal. To say that all men are equal in view of their having intrinsic worth as individuals is not saying anything empirically significant however much be its value as an exhortation. All it says is that a man is to be valued not only for what he has acquired but also for his being a man. Thus it takes us back to the assertion that all men are equal because they are all men.

## II

It appears that we must now abandon our search for positive grounds for the justification of equality. We started our search by considering "all men are equal" as a factual assertion about men. Examination of the several reasons which are advanced as grounds for the assertion of men's equality has convinced us that there simply is no reason for which all men can be considered equal. For, even if all men did possess the particular characteristic in question, they certainly differ in degree to which they possess it and this makes them unequal.

Perhaps we were all along wrong in assuming that "all men are equal" stated a proposition. "All men are equal" is after all not an assertive statement at all in spite of its grammatical form but is some kind of an exhortation or command that one ought to treat every man equally (Peters). Let us explore this interpretation further.

At the outset it must be remarked that the injunction that one

ought to treat every man equally should not be taken literally. Surely, we are not justified in giving the same treatment to the very intelligent and the mentally defective children. Nor are we justified in treating the child that is educationally disadvantaged because of poor home environment, on the same footing as the child that is educationally privileged because of superior home environment. Also we are not justified, to take another example, in making all men pay the same amount of tax irrespective of their income. Justice, rather than flat equality, demands that treatment in such cases be fair and not equal in the literal sense. For, the cause of equality is better served by making the treatment equitable and fair rather than just equal. In the case of the educationally deprived child, justice demands that special incentives and 'compensatory' educational programmes be given to him to make up for the deficiencies. Likewise, it demands that those who earn more be made to pay more taxes and that the mentally retarded child be given a different type of education.

What is implied then by the exhortation to treat all men equally is not that all men be treated literally alike but that they be treated differently if there are relevant grounds for doing so. Injustice results just as much from treating unequals equally as it does from treating equal unequally.

The principle of equality thus gets subsumed under the broader principle of distributive justice which lays down that equals be treated equally and unequals unequally<sup>3</sup>. This sounds like a very harsh and even a cynical assertion until its import is understood clearly. What the principle says is that as far as treatment within a category is concerned it should be equal but between categories the treatment should be different. The first injunction "treat equals equally" amounts to saying that a rule is a rule or there must be no exceptions unless a category of exceptions is created. The second injunction "treat unequals unequally" lays it down that there should be rules placing people in different categories if there are relevant grounds for doing so (Peters). To go back to our example, all children who are within the category of 'educationally deprived' ought to be treated the same as each other and they all as a 'class' should be treated differently from all children within the category of 'educationally privileged'. (In the light of the second injunction, it is assumed that there are clear criteria for placing children in the two categories and the categories themselves are created on the basis of relevant grounds).

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<sup>3</sup>A slightly different formulation of the same principle as "To each according to his need" is preferred by some philosophers. See Vlastos, Gregory, and Gandhi, M.K.

"The problem of course is that of determining what are the relevant grounds for making categories in the context of the second injunction or for making exceptions in that of the first" (Peters, p. 119). For, disputes usually arise over the relevancy of a ground in respect of a particular treatment. History bears evidence to the fact that unequal treatment has been sought to be justified on such grounds as caste, race, colour of skin, sex, etc. Where they are clearly unjust? How then are we going to rule out such grounds that come in the way of equality of consideration?

One way, of course, is to recognize that 'relevance' is not an all-or-none affair. What is relevant to a particular treatment say 'providing opportunities for higher education' may not be relevant to some other treatment, e.g. 'providing free medical care'. (I assume here that both these goods are scarce and hence the situation is rule-governed. If there were an unlimited supply of these goods like air and water then the situation would not be rule-governed and hence there would be no question of distributive justice). While "ability to pursue higher education" may be held to constitute a relevant factor for the distribution of opportunities for higher education, it is obviously not a relevant factor as far as providing free medical care is concerned. Certainly we would not hold that only those who have the ability to pursue higher education be given free medical care. We would perhaps advocate 'poverty' as a relevant factor in the latter case (sickness of course being a logically necessary condition). Likewise, while poverty or merit maybe cited as relevant factors for the award of scholarships, height or skin colour cannot be so cited (unless, of course, it is conclusively established that height or skin colour have a positive correlation with poverty or merit that warrants a discriminatory treatment). Relevancy of a ground for discriminatory treatment, therefore, is to be judged with respect to the commodity that is being distributed. The principle of equality by itself cannot be help in this regard.

Even with respect to a particular commodity or treatment under consideration, it might be asked as to how we decide about the relevancy of the criterion. How, for instance, can merit or poverty be justified as a relevant criterion for the award of scholarships? It appears that such justification derives from a detailed consideration of the nature of the commodity or activity in question and its function in the society. The justification of the criteria with reference to our example can be said to have been derives from a consideration of such basic issues as the purpose of awarding scholarships and the nature of the institution of scholarships, etc. The relevance of grounds cannot be determined without a rationale and without reference to such wider considerations that lend meaning to the activity. Further, to act as guides for action the reasons deriving from

such wider considerations must fall under principles presumably in our consideration of the cases of personal as well as the public good.

The whole point of the argument has been to show that the principle of equality by itself cannot determine what ought to be done in any concrete case of distribution. All it does is to lay down a rule, the rule of impartiality. It says that "no one shall be assumed, in advance of particular cases being considered, to have a claim to better treatment than another" (Peters). It says where the treatment within a category is concerned it should be absolutely equal and where treatment between the categories is concerned, it should be different. But being only a formal principle, it offers no help in determining the relevant grounds for making categories in the context of the injunction. "Treat unequals unequally" or for making exceptions in the context of the injunction "Treat equals equally". For the determination of these we have to appeal to other principles. For example, whether it is the distribution of food (in a ration system), medical care, the right to vote, just wage or education, the principle of equality by itself cannot determine how these goods are to be distributed. What it does say, however, is that *if* poverty is a relevant criterion for, say, providing free education, and sex or caste is not, *then* as far as the provision of free education is concerned there should not be any discrimination among the class of poor people. Every one who is poor (granting that poverty has been defined) by our criterion, should get free education. But such free education, again by our criterion, need not be given to that class of people who are not poor. Likewise, if it is agreed that only those who have the ability and aptitude to pursue higher education should be given opportunities for higher education, then within the group of people who possess these qualities there should not be any discrimination on other grounds (unless a further category of exceptions is created) and they should all be treated equally in this respect. But those who do not possess the required qualities as a 'class' should be treated differently from those who do possess these qualities.

To conclude, the principle of equality is only a formal principle which states that distinctions shall be made only when there are relevant differences. It can thus only supply a necessary, never a sufficient, moral basis for educational policy; for the value of what is to be distributed and the criteria of relevance for making distinctions must derive from other principles.

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# Education of Disadvantaged Children

## A Case Study of The Opportunity School

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*There is a growing realization among the people today that education provides the necessary means for social mobility. Rightly enough, providing minimum educational facilities to the poor and socially disadvantaged has high priority in our national policy. Since most of the incoming children at the elementary school level are first generation learners, often coming from educationally backward communities, the expansion of formal educational system alone may not be sufficient for this purpose. Any educational programme planned to include the disadvantaged children should take proper account of the psychological and sociological factors of their background and should have the following objectives : (i) to instil competence motivation in these children by eliminating the inhibiting influences of their background ; (ii) to interest them in schooling and to absorb them in the mainstream of education by providing them with appropriate opportunities and challenges. These objectives can be effectively achieved in schools organized by dedicated and enthusiastic teachers and citizens of the locality who understand the problems and strengths of the disadvantaged children. Their commitment to the cause of the education of the disadvantaged children can make it possible to run these schools on small budgets. There is undoubtedly considerable untapped human resource in the country to serve such a cause. The Opportunity School at the Indian Institute of Technology Campus, Kanpur, is one such venture.*

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THE Indian Institute of Technology, Kanpur, is a residential academic township. Formal schooling arrangements in this community have been



made only for children of the regular employees of the Institute. The campus school for these children has a fee structure linked to the income of the parents and attempts to provide equal educational opportunity for the children of all cadres of employees.

However, the inadequacy of this gesture towards equal opportunities for minimum education for all children soon became evident. Even as the sprawling houses and neat gardens came up in the township, so did the adjacent overcrowded servant quarters. Since this was a residential campus, soon there was a sizable section of the community whose members had no direct connection with the Institute but served the township and its facilities in various ways. Within a few years after the IIT started we reached a stage of development when those who most needed education had no school to go to<sup>1</sup>. There was even a noticeable increase in juvenile delinquency. Since it was impossible to change the charter of the school run by the IIT, some of us on the campus decided to start a school for these children and this gave birth to The Opportunity School—an elementary school.

### *Aims and Objectives*

Right from the outset, we decided that the school would not only provide free elementary education to children coming from the weakest and the most disadvantaged sections of our community, but also endeavour to instil self-confidence in these children. The fund for this venture was to be raised through donations in the township. Though most of us had minimal experience in this field, the goals and objectives we intuitively set for the school and the instructional strategies we teachers innovated as we went along have been vindicated by the enormous success of the school. It is significant that 90 per cent of our children are first generation learners and a majority of them come from scheduled or depressed classes.

Although the children were first generation learners, we felt that it was important to provide the same standard of education as that of the neighbouring campus school. We made no compromises either in teacher expectation or in student performance. This was indeed a crucial decision, and in my opinion, has been the most important motivating factor. According to Rosenthal and Jacobson: "The lowering of standards or grading too high for a given performance level may actually result in the lessened profit from education found among disadvantaged children". We prescribed the same NCERT elementary school syllabus and textbooks. However, the means and method of reaching the child-

<sup>1</sup>R. Rosenthal and L. Jacobson, *The Pygmalion in the Classroom*, 1968, Holt, Rinehart and Winston, Inc., 107

ren were left solely to the teachers. The medium of instruction is in Hindi, and English is only taught as a language.

Another important objective of the school is the development of the feeling of competence in the children. Due to obvious socio-cultural reasons, these children have little competence-motivation when they first arrive at school. We felt that the success of such a school would depend on whether we could enable the children to cross the social barriers and become psychologically balanced vis-a-vis other children, at least during the brief period they spend at school. White<sup>2</sup> describes competence motivation as a successful interaction with the environment. According to him, competence-motivation is learnt as much at school as in the playground outside. To fulfil this important objective, we have taken many conscious decisions. Our children wear uniforms similar to those in other schools on the campus and this is a great leveller. Also, we annually arrange interschool competitions in debating, essay writing, football matches. The sense of competence displayed by our children and their performance in the above competitions during the last few years have been indeed most gratifying.<sup>3</sup>

### *Teacher-Student Relation*

As the children generally come from illiterate background, the first six months at school (in the kindergarten) are most difficult and crucial for them. The children are taught basic school-going habits (including personal hygiene) which teachers in most schools normally take for granted in children coming from middle class homes. Only when the children are positively oriented towards the school do the teachers begin formal teaching. The time-span from kindergarten to Grade V is viewed as an entire unit rather than as six separate scholastic years. That the elementary school should be viewed as a single integrated unit is recommended by Bernstein.<sup>4</sup> According to him the main advantage here is that it gives the child a greater chance of mastering the skills. We have also found that this approach gives both the children and the teachers time to overcome their particular difficulties. This also helps the

<sup>2</sup>R. White, "Motivation Reconsidered : The Concept of Competence", *Psychological Review*, 1959, 66, 297-333

<sup>3</sup> In addition to winning trophies and prizes in sports, it is noteworthy that they have secured many prizes even in creative arts, essay writing and debating. The children also publish the magazine *Jharoka*, an annual.

<sup>4</sup> Basil, Bernstein, "A Sociolinguistic Approach to Socialisation with Some Reference to Educability" in *Language and Poverty . Perspective on a Theme*, Fredrick Williams (Ed.), Chicago, 1971, Markham Publishing Company.

children to learn at their own pace. In fact, we do not have set timetable for day to day work at school. The teachers plan their lessons for the week and go at a place most suited to the children. This flexibility has evinced greater response from the children.

### *Teachers' Attitudes*

The success of the experiment at the Opportunity School is no doubt due to the dedicated work of the teachers. With the exception of one teacher, all are residents of the campus and as such are aware of the special strength and weakness of the children coming from disadvantaged backgrounds. We have one principal-cum-teacher, four regular full-time teachers and two part-time teacher volunteers. The teachers are paid much less than their counterparts in the campus school but are inspired by the challenging task facing them. Before a teacher is recruited, we request the prospective teacher to observe the school and decide for himself/herself if he/she shares the 'no-caste-no-class' ethos of the school.

### *Budget*

The school is run entirely by donations and voluntary subscriptions. No tuition fees are charged. However, each child pays Rs. 20 towards the textbooks at the beginning of the school year. (We found that this was necessary as the parents were reluctant to buy books once the children were admitted in the school.) The average expenditure of the school is Rs. 1, 200 per month. The IIT authorities have given us two four-room houses for our school. At present there are 180 children in the school.

## THE OPPORTUNITY SCHOOL : AN ISOLATED PHENOMENON OR A VIABLE INNOVATION

*How successful is the opportunity school?* Even its most ardent advocate must admit that its success still remains microscopic and limited within the walls of a highly educated campus. While this school may not provide the blueprint for educational revolution in India, we have been able to establish it as a working model. By utilizing the human resources and by inspiring the people around us to gain grassroot support, we have been able to inculcate a sense of competence even in the first generation learners. By emphasizing the basic skills during the six years

at our school, we have enabled these children to find a place in the mainstream of education. This in fact is the ultimate goal of our school. We want to bring to the notice of educational authorities that if children are given good training in basic skills, even the first generation learners can be absorbed into the mainstream. Many of our children get admission to the Central School where they compete with the children coming from all kinds of socio-cultural background. This year one of our alumni has secured admission to the IIT, Kanpur, through the competitive examination.

It is true that there has not been any spectacular effect of this experiment, but there is certainly a change in the attitudes of children and "at least some children will catch the new way of looking at things and teachers will gain a new sense of purpose"<sup>5</sup>. The multiplicity of the educational demands in India can be met only by diversifying the traditional school system and by adapting the formal curriculum to local needs. The Opportunity School can certainly serve as a viable model which can be duplicated on a large scale in every school with only marginal expense to the exchequer. □

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<sup>5</sup>V.L. Griffiths, *The Problems of Rural Education*, Paris : Unesco International Institute for Educational Planning, 1968, 33.

# Equality of Educational Opportunity

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FEW CONCEPTS in the field of education have been the subject of so much confusion as the concept of equality of educational opportunity. A great deal of this controversy is in fact a debate on what is or what should be regarded as equality of educational opportunity. There is little doubt that the matter of equality has become a major political and ideological issue at present. There are several distinguishable definitions of equality of educational opportunity that are put forward by different groups.

The first is the classical definition which has to do with equality of input, such as the salaries of the teachers, the size of library, laboratory and similar measures of inputs to schools. This definition implies measuring quality of schools by school inputs and measuring equality of schools by equality of inputs.

The second definition deals with what might be called equality of the intangible inputs or intervening states in the schools. These are characteristics such as teacher morale, degree of cohesion in the school, attendance, the general tone and atmosphere in the school—all measures of inputs in education, but the intangibles that do not derive directly from the tangible inputs in schools.

There are two definitions having to do with output. The orthodox definition says that equality of educational opportunity exists when schools with equal student inputs show equal outputs. For example,

schools A and B are considered equal if the same student went to school A or school B and pass out, with the same set of skills as he would have had gone to the other school. The definition is conservative because by implication it leaves the students who come to school differently prepared in the same relative position as they were when they entered.

A radical definition deals with equality of output independent of student input. For example, if two students with different backgrounds going to the same school, come out with the same levels of achievement, then it is considered that the school provides equality of educational opportunity.

Of the four definitions on "equality of educational opportunity", the radical definition seems to be more appropriate. Perhaps the best way to judge the effect of inputs is to look at outputs. However, the idea of equality of educational opportunity is probably a mischievous concept in the sense that it misleads us to believe that we can attain it. As a matter of fact no one could have even seen schools capable of creating equality in students coming from different backgrounds. The outcomes are likely to be unequal even if the schools are strongly and equally effective.

Schools are expected to reduce the degree of inequality rather than establish equality. Reduction of inequality of opportunity should not be equated with equality of opportunity. At this point it becomes important to recognize that complete equality of educational opportunity is impossible. Not every one can have the same teacher or live in the same home environment or travel the same distance to school, to mention just a few things that could be the basis of inequality of educational opportunity. The impossibility of complete equality tells us something about what people do not ordinarily mean when they say that there is equality of educational opportunity. They do not mean that there are no inequalities whatsoever. Rather, they mean that some inequalities can be disregarded in judging whether there is or is not equality of educational opportunity. The scheme of neighbourhood schools and multiple-entry and universalization of compulsory primary education could be considered as part of an effort to promote equality in educational opportunities.

Looking at the Indian scene we will be able to find that equalization of educational opportunity is attempted at by providing free primary education and making it compulsory. In this connection, we must note that equalization of educational opportunity even at the primary level of education is not achieved fully inspite of intensive efforts made. Though nationalization of textbooks for schools has been accepted in principle, we have to go a long way before we could supply free textbooks, athletic equipments and school uniforms. It is clear that we could

do a great deal more to equalize educational opportunity in our country. Theoretically we might

- (a) remove all indirect costs of elementary and secondary education, e.g. supply of textbooks, athletic equipment, musical instruments, etc.
- (b) remove all tuition costs,
- (c) provide intensive academic programmes for children identified to be academically handicapped by their living conditions, and
- (d) provide specialized curricula for many kinds of students who cannot profit from those currently provided.

The above list could be extended indefinitely. Some people might contend that we would not have "true" or "real" equality of educational opportunity until all these things and more were done. Others might contend that we need to carry out only one of these aspects to achieve "equality of educational opportunity". Still others might contend that we need some but not all of these changes. Meanwhile, voices can be heard contending that we already have "equality of educational opportunity", and that there is no need to adopt any of these measures to achieve it. Whichever of these points of view one accepts, clearly it is possible to eliminate many inequalities which are taken for granted. However the equalization process is limited in several ways

Much confusion results from the fact that many factors affecting the equality of educational opportunity are not widely understood. For instance the costs of school education can be quite substantial for the children from low income-groups. This is especially the case when the school provides very little in the way of services and supplies. It is likely that if more people realize the difficulties which some students have in meeting these costs, and the part which these difficulties play in inducing some students to drop out there would be a much stronger tendency for people to say that now we do not have equality of educational opportunity.

There is some support for the belief that equality of dress is an important factor in the equality of educational opportunity. The school uniform is being accepted as a device to avoid inequalities in dresses among the students. Nevertheless, probably few people think about the students' dress.

Indeed, it would be well to recognize that there are absolute limits to equality of educational opportunity. No matter how many other values we are willing to sacrifice, no matter how much human and material resources we are willing to invest to ensure equality of educational opportunity, there is always going to be an inescapable residue of

inequality. If you eliminate the family, and place all the children in the state-supported nursery schools, you must find a way to eliminate all the inequalities between the nursery schools. This is as much of a practical impossibility as eliminating all inequalities resulting from differing home conditions. It is simply not possible to provide every child with teachers of substantially equal ability. In this connection, it may be noted that the same problems have to be confronted by those who wish to equalize the availability of medical, recreational and other services. There are limitations in every endeavour for the equalization of any social service. Procedural equality is usually the issue when there is a controversy over admission to an educational institution. The candidate who is refused admission may claim either that the criteria for admission are "discriminatory" (i.e., deprive him of equality of educational opportunity) or that they have been applied in a discriminatory way. The difficulty is that some discrimination, in the generic sense of "discrimination", is absolutely essential to the operation of an educational institution. The problem is to distinguish between those discriminations which are legitimate and those which involve "discrimination" in an invidious sense.

When the discrimination is due to governmental policies, and is challenged in the courts, the courts must have some criteria for deciding between the legal and illegal discrimination. The courts may sometimes say that the discriminations were legal when they were "reasonable" and that they were reasonable when they were based upon "real differences" between the candidates classified. (For instance, reservations for backward communities in employment, in admissions to institutions of higher education.) The important point is that the categories into which the government divides people must be relevant to a valid governmental purpose.

What about those schools in which pupils are separated on the basis of sex? Are the differences in sex relevant to a valid governmental purpose? The differences would probably be regarded as relevant to certain valid educational purposes. The point is merely that the differences between the sexes might provide a reasonable basis for separate schools operated to achieve a valid purpose. It might be argued that in coeducational schools the boys spend too much time chasing girls or *vice versa*. It might be contended that instruction in certain subjects like biology is more easily carried on in all-girl or all-boy classes.

So far the discussion has been centred around the problems of defining equality in terms of persons who are assumed to be equal in their capacity to profit from the same educational programme. But just as we know that circumstances are never identical, so we know also that there are no two persons who are exactly equal with respect to capacity to pro-



fit from education. If the differences are minute, there is no serious practical problem. But how do we determine whether equality of educational opportunity prevails between one who possesses below-average academic ability and another who possesses the capacity for successful completion of the most advanced professional training?

Equality of educational opportunity involves much more than the equality of opportunity to acquire a certain kind of occupational training. Logically, there may be just as much inequality of educational opportunity when all students are required to take the same academic programme as when there are inadequate or no programmes for students of certain ability levels or occupational goals. Educational theorists have long pointed out that equality of educational opportunity does not mean that every child is to receive identical treatment. To force a gifted child and one who is mentally retarded to take the same academic programme is to ensure inequality of educational opportunity for at least one of them. Psychologically, people tend to be less sensitive to the inequalities inherent in identical treatment for students of widely varying abilities than they are to the inequalities resulting from an educational system which ignores the legitimate claims of several groups in a community with diverse socio-economic-cultural backgrounds. Schools certainly could do a lot to reduce inequality rather than to bring about equality.

Thus equality does not mean that teachers should give the same rewards and penalties to every child. It does not mean either that every student receive the same grade. Nevertheless every student will be graded according to the standards which apply to all. However, no individual will ever be denied educational opportunities on the basis of his caste, creed or economic position. One ought to take the radical definition because it is the only definition emphasizing that equality of educational opportunity requires the strong impact of schools. The focus, however, should be on reducing the degree of inequality, because equality of opportunity appears to be unachievable. This certainly is a very strong statement, but until we accept it, we are doomed to frustration.

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# Equalizing Educational Opportunities

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*For this paper, education is taken as a whole overlooking its break-up into primary, secondary and higher. Illustrations are drawn from the personal experience of the writer. Statistical data are avoided.*

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## I HISTORICAL

OUR EDUCATIONAL SYSTEM, which has been facing one challenge after another over the past quarter century, is now in a doldrum. Despite its growing size and complexity, its quality is virtually lost. This is as much true of our traditional education based on the English model as of the new facilities that have come up since 1950. In spite of the remarkable quantitative growth, and the superhuman resilience of our young students to adjust to almost anything, the 'supply' of education has been unable to cope with the 'demand', in consequence of which there is a growing debate on informal education, adult education, community college and the like. People, who like the present writer are in the field for the entire period or slightly beyond it, are dismayed at the admixtures imposed from above so that there's a widespread feeling that education today has not only become different from what it was, but, in its present form, it is becoming an unproductive exercise. There is cynicism among the students, teachers,

administrators and the society at large. In a recent article, Mr. V. V. John has asked the cynics to stay out. This is all very well, but it will be worthwhile to know the prescription of the learned writer for the growing cynicism community have turned cynical.

Apart from the demand for more education, two fresh demands are:

(i) Equalize educational opportunities for all to meet the needs of a democratic society, and

(ii) Vocationalize education to make everybody use his hand. In point of time, the second demand has come a little too soon, that is, Basic Education, or simply the Wardha Scheme associated with the name of Gandhiji. But the manner in which the State Governments handled it turned it into 'a fraud' (to use an expression from Dr. Zakir Hussain who was the chief architect of the Wardha Scheme). People are now busy with bigger 'frauds' so that the Wardha Scheme has paled into insignificance. The first demand is more recent, since an expectation for it has been created in the Constitution which was expected to provide free and compulsory primary education up to the 14th year by 1960. The expectation is yet to be fulfilled or may not be fulfilled at all. The two demands are not mutually exclusive. An education which is to soothe envy, and gratify the social ambitions at all levels cannot be the sort of rigid structure which the Aryans prescribed for their Brahmins or Plato conceived for his 'guardians', but must start a Master's degree in popular courses like tailoring, laundering and haircutting, as we already have Ph. D.'s and D. Sc.'s in masonry, smithy and carpentry. The point at issue is whether we should demolish rigid courses altogether or segregate them. The majority may favour total demolition.

After the orientalist-occidentalst controversy ended in the victory of the latter (vide Macaulay's Despatch, 1834), English education in this country started slightly more than a hundred years ago with a limited objective of producing 'writers' for the Writers' Building at Calcutta and clerks for the British mercantile offices in the same city and at outstations. But the system so introduced went deeper and "opened the doors to knowledge of modern sciences and arts and provided an important means of promoting unity of outlook among members of diverse regions and ethnic groups" (Mathur, M.V.). Of course, it did not produce a 'land-grant college' type of movement in this country, but that was because the people were not interested in it. There is a tendency now to criticize English education on two grounds: (i) that it sought to restrict education to the newly emerging 'middle' classes particularly the Hindus, and (ii) it created no room for job-oriented education. The first point is true in part, but not the second one.

Although the English education in India was not based on the premise of equal educational opportunities for everybody, it was at least available to any one irrespective of caste, creed and sex who wanted to have it. Compared to the present 'volume' of education, the initial quantum was small, but nowhere and at no level it was less than the demand so that none was required to register a child at birth with some school to be sure of a seat later and no child was put to the ordeal of a couple of years' confinement at the KG stage before he/she was really put in a course of study. The writer happily recalls how he changed his college thrice in the course of two years in the late thirties without being confronted with any difficulty. Today, in contrast, you do not get a seat anywhere from the KG to the highest level of education as a matter of democratic right ; it has to be earned through a competitive examination or, as in the case of some professional courses, on payment of a lump sum, and once so saddled, you have to ride on the same seat till the journey's end. The position is perhaps slightly easy for that privileged group called Scheduled Castes and Tribes and people from backward areas wherefrom demand for education is still less than the quota fixed for them, but the position will not remain unchanged for long. In the selection of courses, too, 'other-directedness' has tremendously increased from the school through all levels of higher education so that one who aspired to be a doctor may end up by being a lawyer or one who intended to be a mechanical engineer may find himself as a geologist. This means a lot of maladjustment and wastage, since the right to select the course of his life is innate in man. Thus when the present writer was in the states in the early sixties, he came across lots of his ex-students from the IIT who had graduated with less popular (meaning less marketable) courses doing their M.S. there in Management to be worthwhile in life.

When we make disparaging remarks about English education, we overlook the fact that this education also contained a certain amount of technical and agricultural education, as education in medicine jurisprudence and commerce, in each case again the supply being more than the demand. Although medical education in the initial stage took some time to strike roots, which was due to the prevalent religious taboos, it was not so with the law education which soon caught up as soon as the British courts were started in this country. The law education provided us not only with some fine talents in jurisprudence, but also, bench and bar alike, provided the top leadership in education and politics. Commerce education became popular during the Second World War. There were quite a few agricultural colleges all over India, and there was the Indian Council of Agricultural Research as an apex institution ever since it was conceived by Lord Curzon. During his stay in Poona in 1944-46, the writer often visited the fine campus of the Agricultural College there.

But there was no 'extension service', as there is none even now, so that the agricultural graduates looked for jobs in the agricultural departments of the states. We had quite a few technical schools, and colleges all over the country, two of them in Calcutta and Dacca, and the Roorkee Technical University. As early as 1905, under the enthusiasm created by the Swadeshi movement, the National Council of Education at Jadavpur, Calcutta (now Jadavpur University), had a technical bias in its curriculum and sent a number of young men abroad for higher technical training. The writer recalls that even in the thirties when he was at a government school in a North Bengal town, there used to be at the same school a two-year technical education programme called 'B Course' corresponding to Classes IX and X, which prepared students for a technical school in the same town, from where they proceeded to Calcutta or Dacca for higher education. All the B Course students were given liberal stipends and yet young men from the *bhadralok* families did not usually join it, or at least needed a lot of persuasion. The writer further recalls that those of his former classmates at the school who were prevailed upon to join the course got the benefit of the war and did exceptionally well.

Even conceptually the idea of providing equal educational opportunities to all had started taking shape in the last phase of the British rule, though at this date it was more precise and less confused than what it is today. This was formulated by Sir John Sargeant, the then Educational Adviser to the Government of India. In a country where 95 per cent people were illiterate, Sir John conceived a very wide base to start with, and his Report (1944) suggested free schooling all over the country at the primary stage plus other facilities like midday meals, free supply of books, stipends and medical aid. This was very sensible. Unlike the Western countries where the candle of education was kept burning throughout the medieval period by the churches, in India, when English education started more than a hundred years ago, there was no education whatsoever and hence, for several decades, and later, secondary education loomed large as 'feeder' to university education. Therefore, primary education was neglected all along. When at long last the British rulers woke up to their responsibility to the masses, the time had come for their winding up.

## II. CONCEPTUAL

As many countries were 'liberated' all of a sudden after the Second World War, 'equalizing educational opportunities' was at once raised to the level of a political slogan and this assumed almost a global magnitude. As these countries became busy with economic planning, so education became integral part of the planning. The job was unprece-

ented in the history of state education in the world. The requirement was two-fold, viz. (i) changing social attitudes and values, and (ii) creating necessary facilities. With rare exceptions, every ministry of education around the world became engaged in implementing short-term plans and drawing up the long-term ones. To meet the situation created by this sudden spurt, the developed countries, notably the United States, Commonwealth and to some extent Western Europe and the Soviet Union, came forward to 'train' the requisite teaching personnel, and when in the early sixties, the writer visited the United States under one of these programmes he came across there thousands of young men and women from over a hundred countries with diverse standards of English and multifarious backgrounds, huddled in all sorts of institutions all over the United States. As regards the Indian students, the stipulation of our Central Education Ministry, the sole consignor, was that none of them should register for a degree, with few exceptions who could be counted on finger tips, every one else registered for an M. S. degree of nine-months' duration in some American school, and became, on return, pillars of technical education in their native land.

A Unesco report on educational planning (*Elements of Educational Planning*, Educational Studies and Documents, No 45, 1962), states that the situation in the developing countries "requires that their educational systems shall provide that equality of educational opportunities which democracy proclaims." Though the definition received wide political support in the Third World, this is no well-founded definition. For, to agree that universal education is needed in a democracy or that a high level of productivity presupposes heavy investment in man-power training carries neither any implication nor guarantee about equal educational opportunities for all. Then on what ground does this equality receive such a wide support? There are three grounds:

1. Equality of educational opportunities has been widely proclaimed to be a 'universal human right'. In this country, it is a 'fundamental right' enshrined in the Constitution. The demand is clearly political and the State (meaning the party in power) is to put it through.

2. To make economic planning meaningful and to ensure popular participation, everybody must get a certain quantum of education. Though expressed in economic terms, the demand is basically political and assumes that all men are capable to receive education.

3. But much more crucial is the third demand which cuts across political line. The demand is that equal educational opportunities must play the same part everywhere that it does in the advanced countries. Such a demand would make sense if it meant that where 5 per cent of a country's population are sent to school, it should be raised to 10 per cent

during the next decade or so, making it a phased programme, moving up in step with economic growth. But to insist that it must be raised to 100 per cent all at once would be simply unrealistic. It would raise the most intractable problem of resources. For instance, India has today 76 universities (19 till 1947), the largest university system in the world, next only to that of the USA and the USSR. If we take our primary and secondary education into account, we have about 80 million students in our education pipeline who would soon be ripe for joining higher education. And all this has happened when per capita income in India is one of the lowest in the world. If the United States, with the highest GNP in the world, is able to spend 10 cents per dollar on education, can India do the same? If not, what quality does she expect from education?

It is doubtful if any of the poor countries including India has ever calculated the economic cost-benefit ratio of education, or evaluated the importance of investment in man compared to alternative uses of the scarce resources. Officers who are planning education in poor countries are often tempted into politically oriented assumptions regarding the benefits and are impelled by demands to correct geographical disparities in educational facilities. The result is that almost everywhere the efficiency norms are in abeyance. In this technological age, education, which has ceased to be a man-making process, is just another industry, and it cannot be judged by equity alone unless the poor countries are ready to throw away their resources without demanding a *quid pro quo* or looking for a quality in it. For a more worthwhile outcome, educational planning in all poor countries including India must pursue what two American educationists C. A. Anderson and M. J. Bowman ('Theoretical Considerations in Educational Planning', *The World Year Book of Education*, 1967) have called efficiency norms, while equity may be allowed to ensure that a ground is laid for longer run developments in the areas which are currently unpromising and that existing economic polarization does not become frozen. If in the poor countries this much is secured, that must be deemed as a great gain.

### III. EMPIRICAL

When the Americans realized in the middle of the nineteenth century that liberal education provided by their Ivy League universities did not fulfil the needs of the country or aspirations, or capabilities of the newcomers, they did not just turn their universities upside down, but conceived the idea of 'land-grant' institutions of which currently there are 67. This idea effected a revolution in the educational history of the United States and

in the history of higher education throughout the world. In 1861, the MIT was chartered so that "one could learn exactly and thoroughly the fundamental principles of positive science, with their leading applications to the industrial arts." Late in the century, President Eliot at Harvard made education research-based, numbered the courses from which the recipients could conveniently choose and made education part-time. Meanwhile when the number of students increased, particularly after the Second World War, some schools like the University of Illinois started a second campus. There is now a demand in America for education for everybody, and this is met by innumerable institutions including the community colleges which are supported by the community at large without upsetting the structure of formal education. Although many Americans are not happy about their education, to a foreign observer like the present writer (unlike Brogan, of course, an observer from Scotland), the American system would appear to be one of the best organized and rooted into the soil.

In contrast, we have a different picture in India where English education has been handled badly both at the school and the university stage by our educational planners since Independence. When in the fifties technical education was started, quality was taken out almost completely from the universities so that the material they were henceforth expected to handle was mostly substandard. The process had its genesis in the thirties, when 'democratization' was started in our education. But then, at that time, admissions to the universities were few, since entrants to secondary education came only from certain sections of the society. With the widening of admissions to the secondary education, particularly after 1937, the traditional policy of automatic entry into the university led to enrolments which were in all cases overwhelming. The situation became worse after 1947. Most of the candidates were first generation entrants to the university education, and many regions had universities for the first time. The few countries that tried to regulate a tide of this sort have simply run into difficulties. India did nothing of the sort, and allowed its education to drift. In this atmosphere, it became henceforth an obligation for the politicians from each region to put pressure on the Central Government to start new universities in their regions, and although the Centre has at last cried a halt to this the pressure for more universities still remains unabated.

With so many new entrants and new classes coming into education, the level of education from school through university has come down. The present demand from some educationists for the removal of the rigid structure and abolition of the examination system indicates that we have reached a stage which is penultimate to catastrophe. The businessmen



could sense this in time. They started their own English-medium schools to train their own children many of whom later go abroad for higher education. Those who remain behind in this country have become a new class in themselves and enjoy a precedence over the language school students in admissions to professional courses as well as in government service. Thus, if democratization of education has been catastrophic in effect, its vernacularization has divided the educated section of the Indian society into two new castes. If during the past twenty-five years India has not produced a single outstanding man of letters or scientist, the reason lies here.

Since in India the process of democratization started at the secondary schools, even the higher technical education could not remain unscathed for long. The technical institutions have to take in students who finish their school education and the present writer, who has been associated with higher technical education since 1951, is an eye-witness of the steady decline in the quality of intakes. Deprived of their initial excellence, our top technological institutions which are run at enormous cost are now fulfilling a ritual called 'post-graduate training and research', but are, for all practical purposes no better than so many technical colleges. We have by now 22 agricultural universities, all started after 1950. Most of these have not attained any standard of excellence and a few others like the Punjab Agricultural University have already been knocked off their pedestal. The extension services, the very heart of agricultural education, are going out of their grip and the programme of a seed-producing nucleus and the production of foundation seeds has also been thrown over. There's a Centre for Rice Process Engineering at the IIT, Kharagpur, on which the Ford Foundation has so far spent several lakhs, but its impact on rice production in West Bengal in general and the Midnapore district in particular is anybody's guess. There were at one time 17 rural institutes, all started with a fan-fare, but all are now reduced to a shadow of their former self, or are affiliated to some universities.

Each of these technical institutions enjoying 'autonomy' have developed into so many little *zamindaries* in free India. Five IIT's have no coordination of their educational programmes, although there is a 'Council' where the Directors occasionally meet under the chairmanship of the Central Minister of Education, and each Institute is drifting in its own way and clamouring all the time for more and still more money. A statutory 'review' is provided for all of them, and the first review by a team headed by Sir Wyllis Jackson in 1959 of the IIT, Kharagpur, resulted in an expansion of post-graduate training and research and a reduction in the undergraduate programme in the sixties. But a second review of five IIT's in 1970 degenerated into a routine affair and one

review report at least drew 80 per cent of its material from the Director's memorandum leading to an unplanned expansion of technical education, since then. In the case of the agricultural universities, there is no review. The virus is now spreading and already some of our universities have started insisting on autonomy for themselves, which in practical terms means the withdrawal of whatever control the State Governments have on university education. Inside, each institution is a hot-house of discontent as any zamindari is bound to be.

All this is happening because the local authorities in each case are not guided by a single norm in anything but build up norms to suit their convenience. There are 'statutes' for the IIT's passed by the Parliament, but they are honoured more by violation. There is no forum in the country where these may be reviewed. Universities are more mismanaged. The Visva Bharati University of Tagore was very much in the news for a long time, followed by the Rabindra Bharati University, named after Tagore, where the VC was unanimously condemned by the faculty, students and employees and was very reluctantly dropped by the State Government. The Calcutta University, the oldest institution in the country, has been reduced into complete shambles. The university was better managed when some retired judge used to be at the head of its affairs. The writer wonders why we cannot go back to the old arrangement. Recently, all the VC's of West Bengal universities told their Chancellor, the Governor of West Bengal that everything was all right in their institutions, that they needed more and more money and that there should be no interference.

The success of an industry depends on rigid financial control and no firm can work long on a deficit budget. Our top educational institutions, both general and technical, are in chronic shortage of funds, real or imaginary. Education, in theory, is a State subject and derives its finance from the State Government which is subject to the discipline of audit and ultimate review by the State Legislature. But they have a second source of finance, the University Grants Commission, which has been started on the British model where Education is neither a Provincial nor a Central subject. But the UGC does not have the apparatus to exercise necessary control and the State Government does not have the will, so that neither the one nor the other can prevent if the major amount of money made available goes down the drain. It is not intended to cite specific cases here, but this much must be said that the Heads of our educational institutions are prone to indulge in prodigality with so much easy money at their disposal. After seeing all this, the present writer is firmly of the view that the American system works better where one of the major functions of the University President is to draw money from as many sources as he can.

Secondary education in India has been the victim of innumerable experiments all these years. In place of  $10+2+2$ , we changed over to  $10+1+3$  or  $11+3$ , with what extra gain nobody can say. Now we are changing over to  $10+2+3$ , though the fate of the middle 2 is yet to be decided. Besides, we are adding a year more. Imagine its cost on professional education. When we had  $10+2$ , the technical courses were run at the IIT for 4 years. When it was changed to 11 years, IIT raised its figure to 5. Now that we shall be having  $10+2$  once again, the IIT must either stick to 5 which would mean prolongation of education by one year, or cut it down to 4 which would make so much of the facilities, both material and human, redundant. Then there is overloading of curricula, 'objective' tests, 'work education' national social service, and what not, which only a prodigy can master. Some of these are not properly defined even. It seems that all our educational planners have been imported from Mars or Venus, and they have no idea of the sort of material that an ordinary teacher handles in an ordinary school. When we are talking of equalizing educational facilities, we are so complicating education that it becomes impossible for most of the young men and women in the country to master it.

#### IV. POTENTIAL

It is heartening that the top-level educational thinking in India is no longer in favour of 'vocalizing' our school curriculum. For one thing, it may turn out so many robots without there being a demand for their skill, and for the other, a job-oriented education stands the risk of quicker obsolescence. At the same time, the demand for doing away with the rigid structures should go and wherever they have been turned into shambles, they should be restored to order. Then perhaps we should go back first to the Sargeant Report which advocated the case of compulsory primary education for everybody. When our present resource position, equalizing educational opportunities at all levels for everybody in the country is still a far-off thing.

In every society, including the one economically most advanced, there exists what Gunnar Myrdal calls an 'underclass' from which the society at large is not drawing the widespread ability that is there. The problem has been identified and been placed on the discussion forum even in the advanced countries. But India with much less resources should not hurry into it. There are many good things in the world, but all good things are, unlike voting right, not meant for everybody. We need to be cautious and selective, and even if the demand for equal educational opportunities gains a majority support, it should be a phased

programme, and a distinct one too. Meanwhile we must scrupulously protect our rigid structures of education, with necessary adjustment in the interest of modernization, which is unavoidable if we must have an elite.

#### APPENDIX

In a recent article in the *Statesman*, Calcutta (28-8-75), Mr. V.V. John has tried to sell the idea about what he calls 'non-formal' education. It is difficult to say from the article how much of this he himself believes in. The authorities cited by him are all American and the immediate impetus is a seminar on American community college held in New Delhi. Assuming that the learned writer honestly believes in all that he has written, it is necessary to sound a couple of warnings. First, in America, non-formal education is supplementary but does not replace the present educational arrangement; in India, there is every danger of our formal educational system being replaced by the informal. Second by non-formal education in America is the responsibility of the community. In India, it will be the exclusive responsibility of the State. Besides, informal education is more formal than it sounds, and more difficult too if it is to be worth while. Informal education is no monolithic system, and is based on the conviction that learning is likely to be more effective if it grows out of what interests the learner than what interests the teacher. Informal education abandons the rigid time-table and demands that the teacher must be informed about many more things and must always be 'at the ready'. The curriculum is not limited to the teacher's plan, but is as broad and unpredictable as the children's interest. The intellectual and emotional demands seem relentless and unending. It seems that these demands of 'non-formal' education have escaped the attention of the learned writer. □

# Analysis of the Criteria for Central Grants for Elementary Education

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*The authors of this paper have highlighted some of the implications of the criteria which any programme of Central assistance to the states would have to take into consideration. They have stressed the need for more systematic study of the socio-economic conditions of the states and their implications for educational planning.*

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THE CONSTITUTION has specified in Article 45 of the Directive Principles, the obligation, on the part of the state, to provide free, compulsory and universal education up to the age of 14 within a period of 10 years after its adoption in 1950. This obligation, equally compelling for the Central and State governments and the local bodies, is yet to be fully realized although substantial progress has been made in providing institutional facilities (Table 1).

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\*The views expressed in this article are those of the authors and do not reflect in any way the views of the Planning Commission.

TABLE 1  
PROGRESS IN ENROLMENT 1951-1974

	1951	1974 (Estimates)	Per Cent Increase
I. Enrolment in Grades I-VIII (Million)			
Boys	16.36	49.84	205
Girls	5.91	28.94	390
Total	22.27	78.78	254
II. Per Cent Enrolled to Population in the Age Group 6-14			
Boys	45.7	81.7	36.0
Girls	17.4	50.6	33.2
Total	32.0	66.7	34.7

Thus, as the above figures indicate, institutional facilities will be available at the beginning of the Fifth Five Year Plan for about two-thirds of the population falling within the obligation of the Constitutional provision<sup>1</sup>.

Two important points require to be highlighted. First, Classes I-VIII encompass two stages, viz the primary and the middle. While the draft Fifth Plan has estimated that by 1974 facilities in Classes I-V are available for about 84 per cent of the children of the age-group 6-11—100 per cent for boys and 66 per cent for girls—for the age-group 11-14 the percentages catered to are 48 for boys, 22 for girls and 36 for both boys and girls. These figures indicate more correctly the magnitude of the task, particularly when one considers the fact that, as the child grows older and his/her economic utility to the household increases, the possibility of his/her enrolling and staying on for the full period becomes remote. Secondly, the all India averages hide the substantial disparity that exists among the states and also within the states. The data in the Fifth Plan, which can be assumed to be only illustrative till more firm statistics become available, indicate that the percentage of children of the age-group 6-11 for whom facilities were available in 1974 varied from 62 in Bihar to 124 in Kerala and for the age-group 11-14 from 21 in Nagaland to 78 in Kerala. The disparity is much wider in the case of girls, the variations being from 34 per cent in Bihar to 120 per cent in Kerala for the age-group 6-11 and from 8 per cent in Bihar to 73 per cent in Kerala for the age-group 11-14<sup>2</sup>.

The disparity among the states—as also within the states—can be due to many reasons such as economic backwardness, social prejudices,

predominantly agrarian character of the population, inadequate attention to educational needs, concentration of large tribal population, and so on. Usually a combination of factors, rather than one single factor, is responsible for a state's educational backwardness. The non-availability of finances, either because of the paucity of overall resources or because of the unwillingness to spend, is regarded as one of the major reasons for this backwardness. Consequently, assistance from the Centre is thought to be of crucial significance for the removal of these disparities. That the states cannot remove these disparities without special assistance or transfer of resources from the Centre was recognized by the First Finance Commission by recommending a special grant of Rs. 9 crores to some states for the promotion of elementary education and by the Sixth Finance Commission suggesting a transfer of resources for reducing the disparity in the provision of elementary education.<sup>3</sup>

#### *Role of the Centre*

The Seventh Schedule of the Constitution gives the states the sole legislative competence in the field of education—subject of course to certain entries in List I (Union List), dealing with, for instance, institutions of national importance, scientific and technical institutions wholly or partially financed by the Government of India and the coordination and determination of standards of higher education. In school education the centre has not been assigned any specific legislative role, although under Entry 20 of List III (Concurrent List), dealing with economic and social planning, it could probably assume powers on the premise that education is an important instrument for bringing about planned economic and social development. The Union government's role in the field of school education has consequently been advisory. The Ministry of Education has, however, been implementing, as part of its plan, programmes related to school education instances of these are the establishment of institutions like the National Council of Educational Research and Training and the National Staff College for Educational Planners and Administrators, the centrally sponsored schemes for assisting the States in the establishment of multipurpose schools, the State Institutes of Education and the Educational Technology Cells, the promotion of girls' education, programme like the strengthening of science education, provision of scholarships, and so on. While these programmes have helped the states in promoting educational improvements they have not led to a reduction of the disparities in the provision of elementary education

#### *Need for Central Grants*

One of the primary objectives of planning is, no doubt, the education of regional imbalances. The need for using Central loans and

grants for this purpose has been accepted, a weightage is given to the relative backwardness of the states in estimating their entitlement to the Central assistance for plan schemes.<sup>4</sup> In education the earmarking of provisions for elementary education in the Fourth and the Fifth Five Year Plans—on the understanding that the states will lose central assistance in proportion to the shortfalls in expenditure—has been resorted to for ensuring that states spend the allocated amounts for this sector. Earmarking has, however, not prevented shortfalls from occurring as was indicated in the Fourth Plan Midterm Appraisal.<sup>5</sup> The diversion of resources from education to other sectors—and from elementary education to other sectors of education—may be difficult to prevent even if the Planning Commission refused to accept diversions.<sup>6</sup> The amounts available for education annually are generally not large and any partial loss of central assistance due to shortfalls in expenditure is not likely to seriously affect the states' resources for development.

The political and other pressures for diversion of funds from one scheme to the other are probably less intense at the central level. It has therefore, been suggested that funds for implementing the Constitutional Directive should partially be provided in the Central Plan and made available to the states on the basis of some well-defined criteria. That the Centre has a direct obligation in this regard is clearly spelt out in the Constitution itself. The Central Advisory Board of Education recommended in its 37th meeting :

That a new programme of Central assistance for provision of universal education should be evolved in consultation with the States under which assistance should be made available to a State on the basis of (a) its needs, (b) its ability, and (c) its effort. No State should, however, be eligible for assistance under this programme unless it puts in the minimum effort prescribed. The effort to be put in by the States as well as the Central assistance made available should be specifically earmarked for this programme.<sup>7</sup>

The problem of equalization of educational opportunities is not peculiar to India. Federal states, where the constituent units have equal resources, are confronted with the problem of ensuring that a citizen is not placed at a competitive disadvantage just because he hails from one state rather than the other. The financing of education for equalization of educational opportunity has been of particular concern in the United States of America. Various bases have been suggested for the Federal Government assisting those states which, for want of resources, are not able to support educational provisions—quantitatively as well as qualitatively—



to the same extent as some of the richer states. It may also be noted that many of these proposals have not been without their detractors.<sup>8</sup>

While financial assistance from the Centre for implementing certain key programmes is generally acceptable, complete consensus in favour of a general purpose grant for the promotion of elementary education facilities does not exist. The educationally advanced states feel that such a programme places a premium on inefficiency and/or unwillingness of the educationally backward states to support elementary education. The argument is that the educationally advanced states have reached the present level by providing adequate support for education in the past; the educational backwardness of the states, in their view, is more due to the unwillingness to provide for education to the desired extent than merely the lack of resources. The educationally backward states, on the contrary, feel that their backwardness is not so much a result of their unwillingness to tax their people as that of the lack of resources; since their tax base is low, the revenues, collected even at relatively higher rates of taxation, do not provide them with sufficient resources to support the promotion of education at the level of the educationally advanced states.

#### *Criteria for Central Grants*

Although they cannot correct the situation as existed in the past, the criteria of need, ability and effort, recommended by the Central Advisory Board of Education, do meet the arguments of the educationally advanced states against Central assistance for the promotion of elementary education. The main problem, however, is to determine, in precise operational terms, the implications of these criteria. The present article attempts to study the various indices which can evaluate the states' need, ability and effort to provide for elementary education.

#### *Need of the States*

In the context of the goal of universalization the overall need of the state can no doubt be determined, very roughly, by the number of non-attending children of the age-group 6-14. Depending upon the prevailing unit of elementary education, this need can also be translated into monetary requirements. Table 2 illustrates the varying magnitude of the problem of enrolling non-attending children faced by the various states.

TABLE 2  
NON-ATTENDING CHILDREN IN 1973-74

State	Non-Attending Children		Per Cent Non-Attending	
	Total	Girls	Total	Girls
	(In lakh)			
1. Andhra	39.05	24.29	10.1	8.8
2. Assam	12.71	8.12	3.3	2.9
3. Bihar	62.55	44.38	16.1	16.1
4. Gujarat	17.18	13.33	4.4	4.8
5. Haryana	9.23	6.98	2.4	2.5
6. Jammu & Kashmir	3.85	2.72	1.0	1.0
7. Karnataka	21.94	13.75	5.7	5.0
8. Madhya Pradesh	39.51	29.40	10.2	10.6
9. Maharashtra	27.93	20.79	7.2	7.5
10. Orissa	22.42	14.68	5.8	5.3
11. Punjab	8.36	5.49	2.2	2.0
12. Rajasthan	32.89	21.75	8.5	7.9
13. Tamil Nadu	9.60	9.27	2.5	3.4
14. Uttar Pradesh	44.58	37.97	11.5	13.8
15. West Bengal	35.40	23.23	9.1	8.4
Total	387.20	276.15	100.0	100.0

We have selected fifteen states primarily because the data on other aspects of study are more or less available for them. Kerala has been excluded from this table because it has more or less provided educational facilities for all the children of the age-group 6-14. In 1974 no educational facilities were available for 387 million children of the age-group 6-14 in these 15 states, of the non-attending children 276 million were girls. The proportion of non-attending children varied from 1.0 in Jammu and Kashmir to 16.1 in Bihar for both boys and girls and for girls separately. About 46 per cent of the non-attending boys and girls and 48 per cent of the non-attending girls were concentrated in the four states of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh.

Because they cannot or do not generate sufficient resources, the educationally backward states find it difficult to accomplish the task of providing educational facilities universally as early as some of the educationally advanced states may be able to do. Assuming, for instance, that the enrolment targets proposed in the draft Fifth Five Year Plan will be fully realized, the number of non-attending children will be 273 million in 1979; of these 217 million will be girls. Most of the non-attending

children will continue to be concentrated in the educationally backward states.

TABLE 3  
NON-ATTENDING CHILDREN IN 1978-79

State	Non-Attending Children		Percentage Reduction	
	Total	Girls (In lakh)	Total	Girls
1. Andhra	26.59	17.84	32	27
2. Assam	9.15	6.86	28	16
3. Bihar	41.84	35.44	33	20
4. Gujarat	10.97	10.20	36	25
5. Haryana	7.22	6.33	22	9
6. Jammu & Kashmir	2.41	1.90	37	30
7. Karnataka	15.69	9.96	28	28
8. Madhya Pradesh	33.86	26.47	13	10
9. Maharashtra	25.14	19.76	10	5
10. Orissa	17.70	13.30	21	9
11. Punjab	2.28	1.87	73	66
12. Rajasthan	17.20	14.94	48	31
13. Tamil Nadu	2.67	2.67	72	71
14. Uttar Pradesh	29.94	28.62	33	25
15. West Bengal	30.59	21.12	14	9
Total	273.25	217.18	29	21

Considering that the overall resources constraints have adversely affected annual plan allocations for education in general and elementary education in particular, the possibility that the Fifth Plan enrolment targets will not be fully realized cannot be discounted; shortfalls may be larger in the case of the backward states, thereby widening the disparity at the end of the Fifth Plan between them and the advanced states. A significant point to note is that, at the end of the Fifth Plan, the proportion of non-attending children concentrated in the four states of Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh will not undergo any substantial change.

Universalization, apart from providing facilities, involves universality of enrolment and retention. The complexity of the problems confronted in implementing the three components of the programme of universalization varies in the states. For instance, the provision of facilities in a sparsely populated and hilly state will place additional burdens on it

than would be true for a more densely populated state where the unit cost of establishing a school and appointing teachers would be relatively much less. Similarly, the enrolment of girls in a predominantly rural state, where social prejudices are much more potent, will require persuasion, public education and special effort to attract women teachers. The retention of students for the full period of compulsory education presents, in its turn, complex problems which may not always be possible of educational manipulation. However, the attractiveness of school to the child and the programme of incentives might partly help in encouraging the students to stay on for the full period. In determining the relative need of the states these and other factors will have to be taken into account.

In arriving at the total need of a state, therefore, consideration would also have to be given to some other factors than merely of the number of non-attending children. The following are illustrative :

*A. In regard to the provision of universal facilities*

- (i) density of population
- (ii) terrain
- (iii) proportion of rural area

*B. In regard to universal enrolment*

- (i) proportion of non-attending girls
- (ii) proportion of the children belonging to Scheduled Castes/  
Scheduled Tribes
- (iii) educational level of the population

*C. In regard to universal retention*

- (i) dropout and stagnation rates
- (ii) proportion of untrained and underqualified teachers
- (iii) physical facilities available in schools
- (iv) pupil-teacher ratio

It must be recognized that the above list is only illustrative and does not exhaust all the factors that may require to be taken into consideration while determining the overall need of a state. Many of the factors are directly or indirectly related to the need of a state—directly, for instance, in the sense that geographical conditions are such that the establishment of schools does not increase the cost of education and indirectly, in the sense that the population of a state is conscious of the utility of education and prosperous enough as not to require persuasion to send children to school or incentives for promoting enrolment.

*Ability of the States*

Having identified the criteria for determining the need of a state, the next step is to develop indices on which their differential ability to

support elementary education can be evaluated. The revenue resources—tax and non-tax—of the states can provide one criterion for the purpose. Since the population of a state determines the magnitude of the service that it has to provide, the revenue resources per capita provide a more useful measure of their relative ability. There are substantial variations in the per capita tax and non-tax revenue resources of the states.

TABLE 4  
TAX AND NON-TAX REVENUE RESOURCES  
OF THE STATES IN 1970-71

<i>State</i>	<i>Revenue Resources (Rs. in million)</i>	<i>Population (Million)</i>	<i>Per Capita Revenue Resources (Rupees)</i>
1. Andhra	1620.1	43.39	37.3
2. Assam	337.8	14.95	22.6
3. Bihar	981.4	56.33	17.5
4. Gujarat	1473.1	26.68	55.2
5. Haryana	620.1	9.97	62.2
6. Jammu & Kashmir	169.6	4.61	36.8
7. Karnataka	1473.7	29.26	50.4
8. Kerala	913.4	21.28	42.9
9. Madhya Pradesh	1377.4	41.65	33.1
10. Maharashtra	3211.8	50.33	63.8
11. Orissa	502.6	21.93	22.9
12. Punjab	1203.0	13.47	89.3
13. Rajasthan	816.4	25.72	60.6
14. Tamil Nadu	1981.2	41.10	48.2
15. Uttar Pradesh	2304.3	88.36	26.1
16. West Bengal	1470.1	44.44	33.4

Assuming that the per capita revenue resources indicate their ability, the states of Gujarat, Haryana, Karnataka, Maharashtra, Punjab and Rajasthan have much greater ability to support elementary education than, for instance, Assam, Bihar, Madhya Pradesh, Orissa and Uttar Pradesh.

For various reasons, the revenue resources of a state do not indicate its ability to support a social service, including elementary education. For one thing these resources depend, among other things, upon the intentions of the state to undertake development activity at a particular level of intensity. A state, deciding to maintain a development activity, like education, at a low level does not need to make a great effort to raise resources for financing it. Secondly, revenue resources depend upon the number and the rate of taxes that a state is willing to levy; this

cationally backward states generally allocate a smaller proportion of their educational budgets to elementary education, for example, compared to Kerala spending 53 per cent of its education budget, Haryana and Punjab spend less than one-fourth, Orissa and Rajasthan less than one-third and Madhya Pradesh, Andhra Pradesh, West Bengal and Assam less than 40 per cent of their education budget on elementary education. Within each of the four categories also there are significant variations.

Like revenues, budgetary resources depend upon a state's ability and intention to collect taxes. Higher rates, coupled with efficiency in the collection of taxes and a greater number of taxable items, will generate more resources although they may at the same time lead to greater deprivation on the part of the citizens, in the sense that their ability to use resources alternatively is adversely affected. The budget outlays for elementary education also depend upon the overall budgetary resources that a state intends to provide for education as a whole.

TABLE 6  
BUDGETED OUTLAYS FOR ELEMENTARY EDUCATION  
IN 1972-73

<i>State</i>	<i>Budgeted Outlay for Elementary Education (Rs. in Million)</i>	<i>Per Cent of the Education Budget</i>
1. Andhra Pradesh	297.0	37.5
2. Gujarat	285.6	47.9
3. Karnataka	354.8	51.3
4. Madhya Pradesh	323.8	38.8
5. Tamil Nadu	444.8	39.8

Table 6 indicates that with a relatively larger education budget, Madhya Pradesh is able to get almost the same amount for elementary education with a lower proportion as Mysore at a much higher proportion. Similarly, Gujarat with a higher proportion of its budget devoted to elementary education gets much less for it than Madhya Pradesh with a lower proportion. What applies to budgetary provision for elementary education applies equally to the overall budget for education which depends upon the priority that a state gives to this development activity.

Because of the position explained above, revenue and budgetary resources cannot be regarded as a true index of a state's potential ability to provide for education. The state income provides a much more valid criteria for determining this ability. Benson has pointed out that "income is a major determinant of expenditure for education" and that the data on national income "provide the most useful measure of the economic capacity of the country to raise its support levels (for education) in the future"<sup>11</sup>. Since the number of people for whom a service has to be

provided indicates a state's overall burden, one would have to use the per capita state income in determining its ability. Table 7 presents the data on per capita state incomes.

TABLE 7  
TOTAL AND PER CAPITA INCOME OF THE STATES

<i>State</i>	<i>Total State Income (Million Rupees)</i>	<i>Population (Million)</i>	<i>Per Capita Income (Rupees)</i>
<i>A. 1970-71</i>			
1. Bihar	24,403	56.33	433
2. Haryana	8,214	9.97	824
3. Jammu & Kashmir	2,371	4.61	514
4. Orissa	10,753	21.93	490
5. Punjab	14,848	13.47	1,002
<i>B. 1971-72</i>			
6. Kerala	12,496	21.30	587
7. Rajasthan	14,590	25.70	568
8. Uttar Pradesh	53,333	88.40	604
<i>C. 1972-73</i>			
9. Andhra	28,334	44.30	660
10. Gujarat	20,260	27.30	742
11. Karnataka	17,153	29.80	576
12. Madhya Pradesh	27,330	42.60	642
13. Tamil Nadu	29,546	41.90	704
<i>D. 1973-74</i>			
14. Assam	9,460	15.80	600
15. Maharashtra	57,558	52.60	1,094
16. West Bengal	31,330	46.20	672

On the basis of the years for which information was available, 16 states have been grouped into four categories. That considerable variations exist in the per capita incomes is quite obvious when figures within the group or among the four groups are compared. In Group A, for instance, the per capita income in Haryana or Punjab was either about twice or more than twice the per capita income in other states. Among the four groups, the per capita income varied from a low of Rs. 433 in Bihar (1970-71) to a high of Rs. 1,094 in Maharashtra (1973-74). Maharashtra's ability to support education was roughly more than two times that of Bihar; the relative educational backwardness of Bihar could, therefore, be attributed to its poverty.

*Effort of the States*

Having demonstrated that the potential ability of the states can be measured by their income, their effort to support elementary education can be measured on two indices, viz. (a) the overall resources that they generate in relation to their income, and (b) the proportion of their income that they utilize for elementary education. Table 8 summarizes the data.

TABLE 8  
EFFORT OF THE STATES TO SUPPORT ELEMENTARY EDUCATION<sup>12</sup>

<i>State</i>	<i>Proportion to State Income</i> <i>Tax and Non-tax</i> <i>Revenues</i>	<i>Expenditure on</i> <i>Elementary</i> <i>Education</i>	<i>Tax</i> <i>Effort</i>	<i>Rank</i> <i>Expenditure</i>
<i>A. 1970-71</i>				
1. Bihar	4.0	1.27	16	6
2. Haryana	8.5	0.54	5	15
3. Jammu and Kashmir	7.2	0.80	7	14
4. Orissa	4.7	0.89	14	13
5. Punjab	7.1	0.53	8	16
<i>B. 1971-72</i>				
6. Kerala	8.8	3.02	4	1
7. Rajasthan	5.9	1.07	12	10
8. Uttar Pradesh	4.2	0.91	15	12
<i>C. 1972-73</i>				
9. Andhra Pradesh	6.3	1.05	10	11
10. Gujarat	8.9	1.41	3	4
11. Karnataka	10.3	2.07	1	2
12. Madhya Pradesh	6.2	1.18	11	7
13. Tamil Nadu	9.6	1.51	2	3
<i>D. 1973-74</i>				
14. Assam	4.9	1.40	13	5
15. Maharashtra	7.3	1.14	6	8
16. West Bengal	6.7	1.11	9	9

The two measures indicate a wide variation both in the effort that the states make in raising resources and the priority that they attach to elementary education. Kerala and Karnataka seem to be the only two states which not only make a serious effort to raise resources but also give a higher priority to elementary education. Maharashtra and Tamil Nadu, on the other hand, make a greater effort to raise resources but do not attach a high priority to elementary education. The data generally reveal that



educationally backward states make less effort to raise resources and also give less priority to elementary education. The rank order correlation derived from the above data works out to 0.38. The correlation coefficient is not high which indicates that greater effort to raise resources does not automatically ensure additional resources for elementary education. The priority that a state gives to it determines the resources that will be available for elementary education.

The equalization of opportunity for elementary education should not be constructed to mean only the provision of institutional facilities for enrolment, although this is a major step in promoting social justice. A more important ingredient of the programme of universalization is that of ensuring that the enrolled children stay in schools for the full period of compulsory education and receive effective schooling. Without this the effort of making the benefits of education available to a large mass of the people for whom the instrumental value of education—for upward economic and social mobility, integration with the mainstream of national life, increasing productivity, changing attitudes towards the size of family, etc.—is largely wasted. Wastage and stagnation rates are important indices for determining the efficiency with which the elementary education system is being operated. Another significant measure would be the level of competence that a child has developed in handling various individual and societal problems. The massive dropout that takes place in elementary schools reduces, for a large segment of our future generation, the possibility of either moving ahead on the education ladder or making more worthwhile contribution to nation's life as useful and productive citizens.

While the major reason for dropout is the poverty of the people, compelling parents to withdraw children as soon as the latter become useful for augmenting the family's meagre resources, the primary cause of stagnation is the ineffective schooling that is generally available at the elementary stage. Many factors cause it—lack of suitable buildings, dearth of even the most elementary equipment, inadequately motivated and underqualified and untrained teachers, curriculum which is perceived to be irrelevant to immediate needs, and so on. Many of these depend upon financial inputs, for instance, for the purchase of educational equipment and for attracting better qualified and competent teachers. In this context the per capita expenditures on elementary education could indicate, very crudely, the effort of the states in making elementary education more productive. As on others, the states show a substantial variation on this measure (See Table 9)

TABLE 9

## PER CAPITA EXPENDITURE ON ELEMENTARY EDUCATION

<i>State</i>	<i>Per Capita Expenditure (Rupees)</i>	<i>Rank</i>
<i>A. 1970-71</i>		
1. Bihar	5.6	12
2. Haryana	4.6	14
3. Jammu & Kashmir	4.2	16
4. Orissa	4.5	15
5. Punjab	6.0	11
<i>B. 1971-73</i>		
6. Kerala	17.7	1
7. Rajasthan	6.1	10
8. Uttar Pradesh	5.5	13
<i>C. 1972-73</i>		
9. Andhra	6.7	9
10. Gujarat	10.5	5
11. Karnataka	11.9	3
12. Madhya Pradesh.	7.6	7
13. Tamil Nadu	10.6	4
<i>D. 1973-74</i>		
14. Assam	8.4	6
15. Maharashtra	13.5	2
16. West Bengal	7.5	8

In the Indian context, where the salaries of teachers account for 80-90 per cent of the recurring expenditure on elementary schools, the per capita expenditures reported above reflect more the amounts spent on the provision of educational facilities than the quality of education that is provided. The effort of the states in promoting quality would have to be evaluated on indices other than the per capita expenditure. That, however, is beyond the purview of this article

In summary, we give below the ranks of the states on the various criteria of need, ability and effort. Although in respect of certain data there is a variation in years, we feel that the rank orders will not materially change even if the states were ranked for a single year (See Table 10).

TABLE 10

## RANK ORDER OF THE STATES ON VARIOUS CRITERIA

State	Need		Ability			Effort			
	Per Cent 1974	Non- Attending 1979	Revenue Resources 1971	Proportion of Education Budget on Elementary Education		Per Capita State Income	Tax Effort	Per Cent of State Inco. me on El. Edn.	Per Cap- ita Exp on El. Edn.
A. 1970-71									
1. Bihar	1	1	16	1	16	16	6	12	
2. Haryana	13	12	3	15	3	5	15	14	
3. J and K	15	13	10	16	14	7	14	16	
4. Orissa	8	7	14	13	15	14	13	15	
5. Punjab	14	15	1	14	2	8	16	11	
B. 1971-72									
6. Kerala	16	16	8	2	11	4	1	1	
7. Rajasthan	6	8	4	12	13	12	10	10	
8. U Pradesh	2	4	13	5	9	15	12	13	
C. 1972-73									
9. Andhra	4	5	9	9	7	10	11	9	
10. Gujarat	10	10	5	4	4	3	4	5	
11. Karnataka	9	9	6	3	12	1	2	3	
12. M. Pradesh	3	2	12	8	8	11	7	7	
13. T. Nadu	12	14	7	7	5	2	3	4	
D. 1973-74									
14. Assam	11	11	15	11	10	13	5	6	
15. Maharashtra	7	6	2	6	1	6	8	2	
16. W. Bengal	5	3	11	10	6	9	9	8	

The significant points that emerge from Table 10 are indicated below

(a) Bihar, Orissa, Rajasthan, Uttar Pradesh, Andhra Pradesh, Madhya Pradesh, West Bengal and Maharashtra emerge as the States with a higher concentration of non-attending children both in 1974 as well as in 1979. Their enrolment effort in the Fifth Five Year Plan—assuming that the proposed targets are fully realized—is not likely to make any material change in their relative position.

(b) The ability of the educationally backward states of Bihar, Jammu and Kashmir, Orissa, Uttar Pradesh, Madhya Pradesh and Rajasthan, as determined by the per capita income is relatively speaking quite low.

Some of these states do not, however, seem to be making efforts commensurate with their ability

(c) The effort of the states of Haryana, Punjab and Maharashtra in supporting elementary education is not commensurate with their ability, this is indicated by their relatively high rank on per capita income and quite low rank on the per cent of income devoted to elementary education on the other hand, Bihar, Kerala, Karnataka, Tamil Nadu and Assam are making much greater effort to support elementary education than their ability seems to warrant

(d) Except for Kerala and, to some extent, Maharashtra and Karnataka the per capita expenditures on elementary education in the states are extremely low, indicating the substandard quality of elementary schooling that is being provided in the country.

In conclusion we would like to make it clear that our purpose in this article is not that of either justifying the need for the central assistance or that of passing judgements but mainly to highlight some of the implications of the criteria which any programme of Central assistance to the states would have to take into consideration. We would like to stress the need for more systematic study of the socio-economic conditions of the states and their implications for supporting education. The implications of such other considerations like occupational structure of the population, proportion of the working population, literacy levels, proportion of the scheduled castes and scheduled tribe population, topographical conditions, etc. would also have to be studied for determining more precisely the need, ability and the effort of the states. Any exercise in this respect can more profitably be done in collaboration with the states, as well as at their level. A global approach to the problem is unlikely to provide meaningful solutions in a situation where large diversities prevail. With technical assistance from the Central agencies, it would be useful for each state to formulate a comprehensive perspective plan for elementary education which concerns itself not only with the provision of educational facilities for the non-attending children but also aims at ensuring that the quality of education provided is of a high standard and relevant to its socio-economic needs

#### NOTES

1. Availability of facilities is advisedly used. Although, because of the very nature of the data on which this assumption is made one has to be cautious in interpreting the figures for under and average children, it is well-known that a large proportion of children enrolled in Classes I-VIII are either below 6 or above 14. Without a firm restriction of admission age to Class I to the age of 6 this phenomenon will continue to prevail. Facilities indicate that places exist and, if they so desire, children of the appropriate age-group can utilize them.

2. The percentages of 124 and 120 for Kerala are due to the presence in Classes I-V of more children than their population in the age-group 6-11

3. See *the Report of the Finance Commission, 1973*, Chapters XII and XV.

4. The basis for the distribution of Central assistance for the states, adopted from the Fourth Plan is 60 per cent on the basis of population, 10 per cent on per capita income, if below the national average, 10 per cent on tax effort, 10 per cent for meeting commitments in respect of major continuing irrigation schemes and the remaining 10 per cent for assisting states to tackle certain special problems like floods, drought affected areas, etc See *Fourth Five Year Plan, 1969-74*, New Delhi, Planning Commission, pp 54-55.

5. *The Fourth Plan Mid-Term Appraisal*, New Delhi, Planning Commission, 1971, Vol II, p. 195.

6. Any diversion of resources from one scheme to the other or from one sector to the other taking place with the approval of the Planning Commission does not result in any reduction of the overall Central assistance to which a state may be entitled.

7. *General Advisory Board of Education—Proceedings of the 37th Session*, 4-5 November 1974, Ministry of Education and Social Welfare, New Delhi, 1974, pp. 45-46

8. See for a review of the efforts made, the arguments for and against federal aid and the various formulae evolved, Beson, Charles S, *The Economics of Public Education*, Boston, Houghton Mifflin Company, 1969, Chapter 8; see also Munger, Frank J. and Fenro Jr., Richard F *National Politics and Federal Aid to Education*, Syracuse, Syracuse University Press, 1964; and Rivlin, Alice M., *The Role of Federal Government in Financing Higher Education*, Washington DC, The Brookings Institution, 1961.

9. The figures for various states have been called out from the *Reserve Bank of India Bulletin*, September 1972 The resources indicated exclude the states' share of central taxes and excise duties and the Central grants.

10. The figures reported in this table are from Expenditure on Education As shown in Central and State Annual budgets, 1971-72, Statement 10 and Expenditure on Education as shown in the Central and State Annual Budgets, 1971-72 to 1973-74, p. 63, brought out in cyclostyled form by the Ministry of Education and Social Welfare, New Delhi.

11. See Charles S Beson, *op. cit*, pp. 42-43.

12. While the figures for tax and non-tax revenues have been taken from the *Reserve Bank of India Bulletins* (September 1972 and June 1974), the population figures for 1970-71 are from the Census and for 1972-73 from the Ministry of Education and Social Welfare publications, "Educational Statistics at a Glance" (Cyclostyled) □

# A Comparative Study of Educational Opportunities

## Muslims *vis-a-vis* Other Communities

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*The approach to education is always conditioned by the system of government that a country chooses for itself. Democracy puts more premium on the individual, and provides him greater freedom. But a socialistic form of government, with its emphasis on social good, comparatively affords lesser freedom for the individual. India after attaining independence struck the golden mean between 'pure' democracy and 'pure' socialism. In December 1954, the Indian Parliament ratified the broad objectives of the government policy as the attainment of 'Socialistic Pattern' of society through democratic means.*

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INDIA is a polyglot nation. It is inhabited by six major communities, namely, Hindus, Muslims, Christians, Sikhs, Buddhists and Jains. For the harmonious development of all communities, it is essential that all sections of the society receive equal opportunity of progress in all walks of life. Education is *sine-qua-non* of social progress, economic betterment and political advancement. It teaches people the art of governing themselves. Therefore, it is necessary that our schools assume responsibility

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\*This paper is based on the author's Doctor of Philosophy Thesis (Education), which was completed on an ICSSR fellowship and accepted for the award of Ph.D. degree by Jamia Millia Islamia in 1975.

both for the application and exemplification of democracy as a distinctive way of life.<sup>1</sup> The Education Commission (1964-66) observes .

.. society that values social justice and is anxious to improve the lot of the common man and cultivate all available talent must ensure progressive equality of opportunity to all sections of the population. This is the only guarantee for building up of an egalitarian and human society in which the exploitation of the weak will be minimised.<sup>2</sup>

Our national policy on education was formulated in 1968, and more recently the Fifth Plan reiterated the pledge to correct disparities in educational opportunities as essentials for promoting social cohesion and national integration. But there is a widespread feeling among the Muslims who constitute about 11 per cent of the population, second only to the Hindus, that they are not treated equally in educational, political, social and economic matters. Since the solution of various problems relating to socio-psychological adjustment depends upon the type, quantum and quality of educational opportunities utilized by the people, the need for the present study is quite obvious. In order to have an objective view of the situation as it exists, the present study was planned. The study was limited to Delhi, the capital of India.

### *Definition of Educational Opportunity*

For this study, educational opportunity is definitively stated in the following terms.

- (i) Schools are provided for the benefit of all citizens irrespective of their caste, religion, social and economic status or any other attribute.
- (ii) It is ensured that wherewithals required to make the utilization of educational opportunity possible are made available to all.
- (iii) The school offers equal attraction to the members of the different cultural and religious communities in terms of their

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1. *Encyclopaedia of Modern Education*, New York : Philosophical Library, 1943, pp. 221-22.

2. *Report of the Education Commission (1964-66)*, vol. I, New Delhi : NCERT, 1970, p. 198.

heritage—a thing which is held dear and of abiding value by them.

- (iv) There is nothing in the school curriculum and textbooks, its procedures and practices, its cultural functions and recreational programmes, that is, in the total environment of the school, that discriminates against any cultural or religious community and is repugnant or abhorrent to the community's accepted beliefs, attitudes, and practices thus repelling it from the school.

### *Hypotheses*

- (i) Other things being equal, the Muslim community seems to have less than its proportional share of educational opportunities as compared with the majority community.
- (ii) There is something inherent in the educational programme itself which discourages Muslims from taking advantage of the opportunity in an equal measure with the non-Muslims.
- (iii) The comparative backwardness of the Muslims in the social, economic and cultural fields makes them utilize educational opportunities to a lesser degree than the non-Muslims.

### *Research Design*

**LOCALE :** The study has been conducted in the cosmopolitan city of Delhi. It covers only the Urdu-medium primary and higher secondary schools, because it is in these schools that Muslim children mostly study. Besides, some other schools (Hindi-medium) have been taken for the purpose of comparing them with the Urdu-medium schools on the different sets of variables.

In Delhi, education is run under a three-tier system. The New Delhi Municipal Committee, Delhi Municipal Corporation and Delhi Administration share the responsibility of providing school education at different levels. The New Delhi Municipal Committee is a small local body with an extremely limited jurisdiction. It runs different kinds of institutions, namely, nursery, primary and higher secondary schools; but the number of schools under its management is very small, as compared to those run under the Delhi Municipal Corporation and Delhi Administration. The Delhi Municipal Corporation is a bigger body and controls almost the entire primary education in Delhi. Middle and higher secondary education falls under the purview of the Delhi Administration.



The objectives of the study call for collection of data from the following sources :

(A) STUDENTS OF CLASSES V, VIII AND XI : Of the 16 Urdu-medium primary boys' and 17 Urdu-medium girls' schools, we selected 6 boys' and 8 girls' schools through random sampling. To have a comparative analysis of the prevailing situation, 5 Hindi-medium primary boys' schools and 5 girls' Hindi-medium schools were selected on the basis of their proximity to the Urdu-medium schools. The distribution of students by community and sex in the sample in Class V is given below :

TABLE 1  
DISTRIBUTION OF STUDENTS BY COMMUNITY IN THE SAMPLE  
DURING 1971

CLASS V					
Sex	Muslim	Percentage of the Total Sample	Non- Muslim	Percentage of the Total Sample	Total
Boys	297	35.6	176	21.0	473
Girls	212	25.4	151	18.0	363
Total	509	61.0	327	39.5	836

The sample includes 61.0 per cent Muslim and 39.0 per cent non-Muslim students in Class V of the primary stage.

The number of Urdu-medium boys' and girls' higher secondary schools is 3 and 2 respectively. All these schools were included for the purpose of study. It was only from these schools that students of Class VIII were taken. To compare Muslim students with their counterparts, i.e. non-Muslim students on the utilization pattern of educational opportunities one boys' and the girls' schools were selected on the same basis as for Class V students. The community and sex-wise distribution of students in the sample in Classes VIII and XI is as the following

TABLE 2  
DISTRIBUTION OF STUDENTS ACCORDING TO COMMUNITY AND  
SEX DURING 1971

(a) CLASS VIII					
Sex	Muslim	Percentage of the Total Sample	Non-Muslim	Percentage of the Total Sample	Total
Boys	294	45.8	103	15.7	397
Girls	141	20.0	114	18.5	225
Total	435	65.8	217	34.2	652
(b) CLASS XI					
Boys	172	34.3	84	16.7	256
Girls	128	25.7	117	23.3	245
Total	300	60.0	201	40.0	501

The Class VIII sample includes 65.8 per cent Muslim and 34.2 per cent non-Muslim students, and the Class VII sample includes 60.0 per cent Muslim and 40 per cent non-Muslim students.

(B) All the principals, headmasters and teachers of schools in which the study was conducted were included in the study.

(C) PARENTS . 50 Muslim parents on the basis of purposive sampling were selected.

(D) PUBLIC LEADERS : In all, 45 persons representing various political parties, educationists and social-workers were interviewed to record their opinions on various problems pertaining to the Indian Muslims.

### *The Data*

Data was collected on the following variables.

- (i) Neighbourhood; its general background.
- (ii) Educational, occupational, economic, social, cultural and ecological background of each family.
- (iii) Institutional environment of the school attended by children, curricular and co-curricular programmes and practices, and attitude of teachers towards them.
- (iv) Social distance and hurdles in their social interaction.
- (v) Typical problems faced by the Muslims as a minority community in India.

The data for the present study came from four sources : (1) questionnaires ; (2) interview schedules , (3) school records, and (4) Cattell Culture-Free Intelligence Test.

### *Significant Findings*

Tables 3 and 4 show that the Muslim community is far behind in comparison to the other communities in the utilization of available

TABLE 3  
COEFFICIENT OF EQUALITY FOR THE MUSLIM COMMUNITY AT  
THE PRIMARY STAGE OF EDUCATION IN DELHI

Area	Population		Enrolment		Coefficient of Equality.
	Muslim	Non-Muslim	Muslim	Non-Muslim	
New Delhi Municipal area	7,086	294,715	423	20,577	85.4
Municipal Corporation area	243,569	3,044,314	15,119	354,574	62.6
New Delhi Municipal and Municipal Corporation Area	250,665	3,339,029	15,542	375,151	74.0

\* Population is based on 1971

educational opportunities. The 'coefficient of equality' which comes to 74.0 and 23.6 at the primary and higher secondary levels of education respectively is sufficient to prove the backwardness of the community in the field of education.

We find that practically in most of the primary schools, libraries are housed in the classroom. However, schools attended by Muslim children offer poorer library facilities in terms of average number of books available and number of books issued per student. Even at the higher stages, Urdu-medium schools are providing nominal library facilities.

Most of the Urdu-medium schools, irrespective of their type, are located in the congested part of the city, where sanitary conditions are very poor and environment is far from stimulating. School buildings are in a bad shape, and most of them are devoid of basic amenities, such as, proper arrangement of ventilation and toilet facilities. The very look of the building gives the impression that it was not built to house a school.

The Urdu-medium schools are overcrowded, and a teacher has on the average more students in the class than a teacher in a Hindi-medium school. One reason for the overcrowding seems to be the fact that there are very few Urdu-medium higher secondary schools to cater to a larger number of students from this community.

The main reasons which restrict the Muslim students of Grade XI to attend the schools of neighbourhood are in the order of importance, non-availability of instruction in their mother-tongue, father's disliking, for the school and objectionable nature of the school programmes on religious grounds.

One-way analysis of variance shows that there is a significant difference at .01 level in the mean age and intelligence of Muslim and non-Muslim boys of Class V. And this is in favour of Muslim boys. However, no significant difference is found on other variables such as their socio-economic status and scholastic achievement of the two groups. From this it is clear that Muslim boys are late in joining the school. The same is true about the Muslim girls of the same grade. However, the Muslim girls included in our sample are of better socio-economic status.

We do not find any significant difference even at .05 level between the mean age, socio-economic status and intelligence of Muslim and non-Muslim boys of Class VIII. But in their achievement in English, Muslims are favourably placed as compared to their counterparts. On the other hand, Muslim girls are late in joining the schools. However, there is no significant difference between the Muslim and non-Muslim girls on the other variables such as their socio-economic status, intelligence and achievement.

While comparing the Muslim and non-Muslim boys of Class XI, we find no significant difference on the variables of age, socio-economic

status, intelligence and achievement. However, Muslim girls of Class XI, though of the same mean age, socio-economic status, intelligence, excel their counterparts of their performance in English.

The teachers of Urdu-medium primary schools have better academic records as compared to their counterparts in other schools, but the teachers of Urdu-medium higher secondary schools have slightly poorer educational status in comparison to their counterparts in other schools.

Our interviews with Muslim parents indicate that barriers which stand in their way of making full use of educational opportunities for their children may be ranked in order of importance as social and cultural, economic and religious factors, unrelatedness of education to job opportunity and restriction of admissions in the school of their choice. However, the most potent single cause that discourages Muslim parents from sending their daughters to schools is their abhorrence of modern education which, according to their conviction, spoils the girls.

Our interviews with certain public leaders, educators and prominent citizens of Delhi on the problem of Muslim education reveal that barriers encountered by the community in the use of available educational opportunity are varied, complex, interrelated and rooted in their tradition. The first cause of the present situation is historical such as migration of Muslims with learning tradition to Pakistan and neglect of their former centres of learning, e.g. Bhopal, Aligarh, Lucknow and Deoband. The second is illiteracy prevalent among the Muslim masses. The third reason is that there is no place of religion in the school curriculum. The fourth is the fear that there is a deliberate attempt by the government to impose upon them the majority culture through school programmes. The fifth and most vital reason is economic compulsion that do not allow them to spare their children for schooling. Besides, the Muslims feel the sting of the prevailing bias against Urdu which is their mother-tongue. The high cost of schooling and unemployment among the educated youth are also a discouraging factor.

### *Conclusion*

To sum up, the study is aimed at examining three hypotheses. The first of these states ; "the Muslim community utilizes less than its proportional share of educational opportunities as compared with the majority community." To test this hypothesis a 'co-efficient of equality' has been computed both at the primary and higher secondary stage, which comes to 74.0 and 23.6 respectively. Therefore, this lends support to our hypotheses and substantiates that the community in question is far behind in the matter of using educational opportunities which have been offered by the Union Territory of Delhi. Moreover, this shows that the position is worse at the secondary stage than at the primary stage of education.

The second hypothesis is : "there is something inherent in the educational programme itself which discourages Muslims from taking advantage of the opportunity in an equal measure with non-Muslims." To test this hypothesis two interview schedules, one each for public leaders and parents; and two questionnaires one each for the headmasters and teachers have been administered. It is found that factors which discourage them from the use of educational opportunity are many, namely, scarcity of Urdu-medium books, inadequate provision of Urdu-medium schools, the fear of Muslims that other schools attempt to impose the culture of the majority community and non-availability of religious education. Further, it is found that the gap in the utilization of opportunity by the Muslim community has widened because of the factors mentioned above. Besides, the schools attended by Muslim children are overcrowded, understaffed, housed in dirty and ill-equipped buildings, lacking proper ventilation and library facilities. Since Muslims are concentrated in certain *mohallas*, they tend to have a segregated school of an inferior order. The Muslims strongly feel that there is a distortion of historical facts in the textbooks which injure their feelings. Thus the hypothesis that there are certain factors inherent in the school system itself, which discourage the Muslims to make a proper use of the educational opportunity, is substantiated.

The third hypothesis states : "the comparative backwardness of Muslims in the social, economic and cultural fields makes them utilize educational opportunity to a lesser degree than the non-Muslims". To test this hypothesis, a questionnaire was administered to a sample of students of Classes V, VIII and XI. It is found that there is no significant difference between Muslims and non-Muslims in this regard. This may be due to the fact that the sample taken in the study consisted of Muslims and non-Muslims belonging to the same class. They are from the same locality, more or less, from the same occupation and have similar living conditions. Certainly, in the city of Delhi, there are far better schools available for those who receive their education through media other than Urdu. But the same thing cannot be said about those who wish to pursue their studies through Urdu. For there are no better Urdu-medium schools available in Delhi than those which have been included in this study. This fact does affect the provision of equal opportunity for education more adversely in the case of Muslims of Delhi, who would generally like to educate their children in Urdu-medium schools.

The opportunity, its awareness and utilization are required to be understood in their proper perspective. In one situation, the opportunity may exist, but lack of awareness on the part of the users results in its non-utilization. In another case, people may have full knowledge

about the opportunity provided by the State, but it may remain unused, because they do not approve of it. An analysis of the prevailing situation makes it sufficiently clear that the Muslim masses fall in the second category. An important question arises as to what lands them in this lamentable situation, and why they do not take advantage of the opportunities which are accessible to them. Causes are not to be found on the surface, but these have to be probed deeply in the context of the overall situation, which is rather complex. The Muslim community, unlike other communities, is classified only into two strata, i.e. the lower and upper strata of people. This stratification is relatively rigid. There is hardly a middle class. The absence of the middle class deprives the community of leadership which serves as an important link between the lower and the upper strata, identifies the leadership with the masses and espouses their cause. The upper class of this community is so much pre-occupied with the pursuit of its self-interests, that it has no time to think about the weaker section of the community. This group tries to grab all the opportunities which it demands in the name of the masses. The gap between the two groups is so wide that there is little mutual intercourse.

To say that the Muslim community suffers in the matter of education on grounds of economic compulsions only is partly true. The Muslims are emphatic about the inclusion of religious teaching in the curriculum ; and this to a great extent accounts for their aversion to the modern system of education. It seems that social justice is not just a matter of changing the law, but of rather changing the character and structure of society, its attitudes and its practices. □

# Problems of Equalization of Educational Opportunities for the Tribal Children

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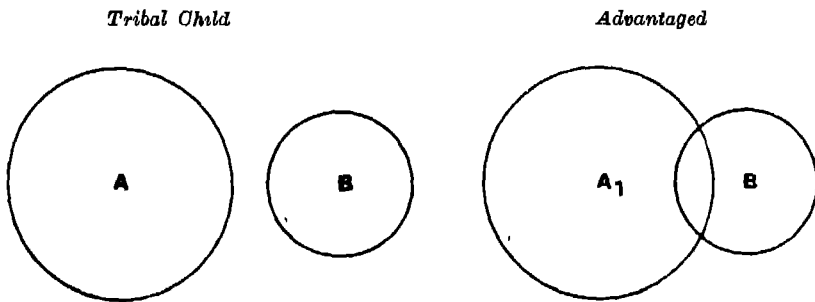
WITH A VIEW TO bring about social justice and political equality the Indian society has rightly set the national goal of creating an egalitarian society in the near future. In fact, this has been the socio-political goal of the entire world in the second half of the twentieth century. In addition to the various social and economic measures taken in this direction, equalization of educational opportunities for all the sections of the society—the rich and poor, the urban and rural, the socially advantaged as well as the socially disadvantaged—has been envisaged as one of the major instruments for the upward social mobility of the disadvantaged. But the problems and obstacles in creating the conditions for the equality of educational opportunities are so stupendous that unless the educationists, social reformers, political leaders and administrators work jointly with a single-minded socio-political dedication it is not possible to achieve this end, in spite of the colossal expenditure of money in this regard. Appointment of additional teachers, construction of more school rooms and supply of excellent books would certainly go a long way in improving educational facilities but still the education of certain sections of the population, particularly the tribal children would remain as backward as ever.

The very subtle psychological and cultural problems of the tribals will stand in the way of their integration to the mainstream through educational processes.

# PSYCHO-SOCIAL PROBLEMS OF THE TRIBAL CHILDREN

## *Problems Relating to Cognitive Growth*

By the time the tribal child comes to primary school at the age of 5 or 6, his cognitive growth is already depressed (Rath 1974 b). His home environment is devoid of any intellectually stimulating conditions. The uneducated parents cannot possibly satisfy his natural curiosities about the environment. His innumerable questions remain unanswered. The parents being very poor remain absent from home most of the times, earning their daily bread and the child stays with their likes in the neighbourhood, or with uninformed elders. The language used by them is extremely poor in expression and their verbal underdevelopment is pervasive. Moreover, whatever language he uses at home is also quite different from the standard language used in the primary schools. The textbooks used in the schools are written by writers belonging to culturally advantaged class; so the concepts and images symbolized in the standard use of words are quite foreign to the tribal children. So when a tribal child comes to Class I and reads the first reader written in the standard language he starts with zero linguistic information and conceptualization, whereas a child belonging to the advantaged class has quite a few familiar concepts and linguistic associations in common. Circles A and B, which are quite exclusive by nature, represent the existing linguistic background and new expected areas of acquisition respectively, in the tribal children, whereas in the case of the advantaged children, the two circles have a great deal of overlapping area.



- A—Linguistic background
- B—New area of acquisition given in the textbook
- A<sub>1</sub>—Enriched linguistic background



In the case of the tribal child all the contents of circle B which is completely new to him are to be acquired, whereas an advantaged child is required to acquire only a portion of area B. If they belong to the same class and taught by the same teacher, the tribal child is bound to develop certain amount of deficiency in linguistic and conceptual acquisition compared to the advantaged (Table 1). Even if the tribal children are

TABLE 1  
COMPREHENSION AND ASSOCIATION SCORES OF BRAHMIN  
AND SCHEDULED TRIBE CHILDREN

<i>Nature of Words</i>	<i>(N=110 in each group)</i>		<i>t</i>	<i>Level of Significance</i>
	<i>Mean Score for Brahmins</i>	<i>Mean Score for Scheduled Tribe Children</i>		
Scientific Words Association	155.28	115.24	5.11	.01
Comprehension	41.87	27.79	9.75	.01
Literary Words Association	135.26	99.46	3.93	.01
Comprehension	45.33	27.52	8.47	.01
Abstract Words Association	117.23	94.19	2.88	.01
Comprehension	32.32	17.83	8.55	.01

taught in separate schools, the deficiency would still grow in a time-bound linguistic curriculum. This deficiency acquired in Class I, will accumulate progressively as the child goes through other classes and his accumulated deficiency is ultimately responsible for stagnation, dropout and weaker motivation for higher education. The deficiency left unchecked at the earlier stage is likely to cause irreparable damage to the intellectual as well as cognitive growth in the developing child. Dutsch (1965) calls this the "cumulative deficit phenomenon". Such deficits in Class I become more marked in the higher classes. So in order to prevent this process of determination which may start in Class I of the primary school, something has to be done before the child comes to school. Hence, there is a necessity of a pre-school educational programme for the tribal children.

There is a great deal of experimental evidence to show that developmental processes before the age of 5 and 6 are extremely important for proper cognitive growth. Bloom (1964) states that about 50 per cent of development takes place between the conception and when the child four years old, about 30 per cent between ages 4 and 8 and about 20 per cent between ages 8 and 17. He further states that it is in the interest of the school to halt the cumulative deficits of these children as early as possible in order to make latter instruction and learning increasingly effective. "It would be most efficient and effective if the early learning in the home prepared these children for the elementary school. Where the home

cannot provide this preparation, it would be in the interest of the child and the school if this could be done during the nursery school-kindergarten period". This fact is also emphasized by Cohen (1969) when he made this generalization "The earlier we apply compensatory, high intensity education, the better the results are likely to be. In an elementary school, early intervention in the kindergarten or first grade and preferably in the pre-kindergarten is the best attack on the retardation in the culturally deprived child. This intermediate grades are dangerously late and junior high school compensatory education yields meager results"

#### *Problems Relating to Personality Adjustment*

School as a social institution is a completely new environment for the tribal children. They are expected to become active participants in this new culture. So to start with they face problems of adjustment to this new social situation imposed on them. The adjustment problem is also linked up with personality deficiencies which they are likely to develop in the context of educational processes. In the atmosphere of sub-culture the tribal children may develop low self-esteem and inferiority in comparison with others. There are enough evidences to indicate that children with low level of aspiration and almost zero educational background have low self-esteem and strong inferiority in school environment. This itself may be the single major cause of early dropout. This problem has to be tackled by specially trained staff including the subject teachers. This is not only true of the scheduled tribe children but it characterizes any group of culturally deprived and socially disadvantaged. It may be relevant to quote a passage about the scheduled caste people discussed elsewhere by the author (Rath 1974). "Due to social isolation and cultural segregation, the scheduled caste communities are found to have more personality aberrations compared to the upper caste communities.

On account of centuries old social stigma and cultural condemnation, the scheduled caste communities seem to conform to the prevalent social norms imposed upon them by the society in having a degrading self-image of themselves. According to the same argument, the upper caste people also conform to the social norm by projecting better self-respecting images for themselves and degrading images for the scheduled caste people".

#### *Problems Relating to Physical Needs*

If the school does not create stronger motivation and provide positive incentives, they are not likely to overcome the first obstacles they face in the first year itself. "The motivational factors for learning in case of these children being very weak (Rath 1973), systematic attempts should be made to raise the motivational strength by national and social incentives. What should be the exact nature of such incentives would depend

on research findings for the different groups of children belonging to different areas of the country. Free mid-day meals seem to have increased the enrolment figures of scheduled tribe children in Orissa (Roy & Rath 1972)". In addition to good food and dress other more acceptable reinforcements have to be provided to keep them in school. In other words, the school should be more attractive than his poverty stricken home. All the physical needs required by a child in any good home have to be provided in the school. It is easier to get it done in the residential schools for the tribal children, but ways and means should be devised to enrich the day schools also.

# *Problems Relating to Aspirational Level*

From our studies it is clearly seen that levels of educational and income aspirations as well as job requirements are extremely low in the tribal children as well as in their fathers. This is really a very serious matter in the context of equalizing educational opportunities for children. With such low level of aspiration, it is difficult to retain these children in the school for long. If the parental aspirations, which normally force the children to come to the school and continue their education for a longer period, is also low, then it is almost impossible to keep them in school. If the parents of scheduled caste groups do not want education for their children no amount of slogans and verbal persuasion is likely to succeed in creating stronger motivation in their children. So such children who come to school under extraneous pressure with no stable aspirations or motivations are not likely to go far. When the teaching and learning situation is dull and it becomes increasingly difficult for these children to follow it, they drop out of school as quickly as possible. As there is no push from home and no pull from the school, the child adopts the normal behaviour of escape from such a painful and constrained situation. The data presented in Tables 2 and 3 would illustrate the case.

TABLE 2  
X<sup>2</sup> RESULTS ON THE ASPIRATIONS OF BRAHMIN AND TRIBAL  
STUDENTS FOR MONTHLY INCOME, OCCUPATION AND EDUCATION  
(N = 110 in each group)

Variables	Categories	Percentages		X <sup>2</sup>	Level of significance
		Brahmin	S/T		
Income	Below 50	0.00	13.91	55.67	.01
	51—100	4.34	20.00		
	101—150	2.60	21.73		
	151—200	6.95	20.86		
	201—250	4.34	6.95		
	251—300	4.34	5.21		

*Contd. on next page*

# EDUCATIONAL OPPORTUNITIES FOR TRIBAL CHILDREN

TABLE 2 (Contd.)

	301—350	1.73	0.00		
	351—400	6.95	2.60		
	Above 400	67.82	6.08		
	Can't say	0.86	2.60		
	Doctor	23.47	5.21		
	Engineer	12.17	4.34		
	Teacher	6.08	30.43		
	Officer	13.04	2.60		
Occupation	Businessman	8.69	6.95	73.82	.01
	Clerk	3.47	14.78		
	Peon	0.86	6.95		
	Cultivator	0.00	8.69		
	Others	13.91	13.04		
	Can't say	18.26	6.95		
	M.E.	0.00	13.04		
	Matric	9.56	53.04		
	I.A.	2.60	16.52		
	B.A.	32.17	8.69		
Education	M.A.	26.95	3.47	80.47	.01
	Medical	17.39	2.60		
	Engineering	4.34	1.73		
	Others	2.60	0.00		
	Can't say	4.34	0.86		
	M.E.	1.73	17.39		
	Matric	15.65	41.73		
	I.A.	2.60	14.78		
	B.A.	20.00	7.82		
	M.A.	1.13	0.86		
Parental aspiration for education (as estimated by children)	Medical	10.43	0.86	128.38	.01
	Engineering	1.73	0.86		
	Others	2.60	0.00		
	Can't say	26.08	15.65		

TABLE 3

X<sup>2</sup> RESULTS ON THE ASPIRATIONS OF THE PARENTS OF BOTH BRAHMIN AND SCHEDULED TRIBE CHILDREN FOR CHILDREN'S EDUCATION AND OCCUPATION

(N = 110 in each group)					
Variables	Categories	Percentages		X <sup>2</sup>	Level of Significance
		Brahmin	Sch. Tribe		
Occupation	Doctor	18.26	2.60	116.16	.01
	Engineer	7.82	2.60		
	Teacher	3.47	26.95		
	Officer	15.65	6.95		
	Business	15.65	0.86		
	Clerk	1.73	13.04		
	Peon	0.00	5.21		
	Cultivator	0.86	5.21		
	Others	0.00	0.00		
	Can't say	36.51	36.52		
Education	M.E.	0.00	13.91	30.34	.01
	Matric	6.95	46.08		
	I.A.	7.82	21.73		
	B.A.	16.52	3.47		
	M.A.	34.34	2.60		
	Medical	11.30	0.86		
	Engineering	3.47	0.00		
	Others	6.08	5.21		
	Can't say	23.47	6.08		

When this problem was once discussed in a seminar attended by a group of educationists belonging to the elite, some prominent participants raised the question as to why people should be worried about the low level of aspiration of the scheduled caste and scheduled tribe people.

This attitude of some educators might explain the fact that 15 per cent of the tribal college-going children were not even aware that special reservations of jobs, etc. were provided for them by the government (Rath and Misra 1973). This social attitude should be changed otherwise a large section of the Indian population will remain backward for all time to come. It is absolutely desirable that all possible efforts should be made through propaganda media to raise their level of aspiration.

*Problems Relating to the Attitudes of Teachers*

The programme of equalization of educational opportunities for the tribal children must include a well planned teacher-training scheme.

TABLE 4  
TEACHERS' ESTIMATION OF BRAHMIN AND TRIBAL CHILDREN  
(N = 115 in each group)

<i>Nature of Estimation</i>	<i>Criteria for Estimation</i>	<i>Percentages</i>		<i>X<sup>2</sup></i>	<i>Level of Significance</i>
		<i>Brahmin</i>	<i>Sch. Tribe</i>		
Interest in Study	Not Good	13.04	12.17	2.14	N.S.
	Normal	42.60	52.17		
	Very Good	44.34	35.65		
Behaviour	Not good	0.86	0.00	17.18	.01
	Normal	26.95	41.73		
	Very good	72.17	58.26		
Future in Study	Not good	5.21	18.26	43.50	.01
	Normal	38.26	49.56		
	Very good	56.52	32.17		
Interest of Guardians	Not good	7.82	9.56	10.17	.01
	Normal	31.30	53.04		
	Very good	60.86	37.38		
Estimation of Intelligence of the Child	Not good	5.21	15.65	39.88	.01
	Normal	61.73	64.34		
	Very good	33.04	20.00		

The inferiority and low self-esteem of the tribal children do elicit very derogatory responses in the teachers towards these children. Such reactions of the teachers in a teaching-learning situation cause irreparable damage in the tribal children who already harbour strong psychological traits in the strange classroom situation which belongs to a different subculture. So the teachers should be trained to treat these children

with great sympathy and affection. Not a word of discouragement should be used by the teachers directly or indirectly. In most of the cases, the favourable and unfavourable attitudes of teachers are highly correlated with the academic achievements of the students and as the examination marks in most of the subjects of the tribal children are poorer than others, the teachers are likely to show the attitude of disapproval. This assumption may be corroborated by the data presented in Table 4. In one of our studies (Rath 1972) it was found that the teachers have low estimation of tribal children in regard to their intelligence, future interest in studies, total behavioural pattern and the interests of their guardians, compared to the Brahmin children who read with them in the same class (Class V). In the same study it was found that the tribal children are inferior to Brahmin children in all the school subjects except in drawing. The former were in no way inferior to the latter in the scores of progressive matrices which measured intelligence. But even then they are estimated by the teachers as poorer in intelligence because they do not do well in class examinations. In the face of this objective assessment of the estimation of the teachers it would not be surprising if this derogatory attitude is expressed repeatedly by the teachers during the classroom interaction.

This would certainly create a very dangerous situation for the tribal children in the school. In fact, these children need special treatment at the hands of the teachers; they should get specialized training to handle such children. But hardly any attempt being made in this important area of teacher training.

"Moreover as this programme has to be concerned with the whole child and not just with his classroom achievement, close cooperation with the parents as well as with other educational, health and welfare agencies available in the locality is considered essential. This programme should also include a lot of outside activities, including summer camps, sports and other interesting recreational activities" (Rath 1974 (b)).

### CONCLUSIONS

In short, the programme of equalization of educational opportunities for tribal children has to tackle some specific problems which may be considered the *sine qua non* of any educational improvement for them. They form a very big chunk of culturally deprived and socially disadvantaged. So they face all the difficulties inherent in a psycho-social phenomenon of this type. As they are culturally deprived their cognitive growth is retarded, their linguistic ability is very much depressed and their conceptual development is of a different type. As they are socially disadvantaged

their home environment is devoid of any intellectual or scholastic stimulation. The parents being very poor and illiterate and therefore cannot render any academic help to their children. Since the children and their parents do not have any aspiration for better educational attainment and higher income, it is initially difficult to bring these children to school and it is still more difficult to retain them there for long. In addition to this, the teachers teaching these children may not be very sympathetic to them and it may so happen that an important section of the policy-makers may not also be interested in raising their aspiration for better education and higher income. In the face of all these difficulties those who are seriously planning to bring about equalization of educational opportunities for the tribal children will certainly face an uphill task.

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# Changes in Immediate Memory-Span

A Longitudinal Study of Children from  
3 to 5 years

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THEORIZING and experimenting on memory process has become a major interest and activity in psychology. However, much of the research has been conducted with college students as Ss. The lack of developmental analysis in memory research and theory has been discussed by Palermo (1970) :

It is rather surprising to find that most child psychologists have shown a marked lack of interest in most of the problems of memory that have been attracting the attention of so many other researchers in the past few years.....Nor have researchers working with children shown much interest in short-term memory, despite the fact that results showed that research in this area is feasible with pre-school children and that differences in short-term memory of children and adults may exist.

The primary aim of the present investigation is to study the developmental changes in the immediate memory-span of preschool children between ages three to five years. The data presented in this study come



from a longitudinal project on preschool testing conducted by the Department of Child Development, M. S. University of Baroda, Gujarat.

## METHOD

### *Subjects*

A total of 52 *Ss* were tested under the preschool testing programme. Of these complete longitudinal records on memory items (for the period under study 3-5 years) were available for 15 children (6 girls and 9 boys). The data on 36 subjects (15 girls and 21 boys) has been treated cross-sectionally for purposes of comparison.

### *Procedure*

The children were tested individually at six-monthly intervals from ages 3-5 years. For securing data on immediate memory the following instructions were given to the child: "I shall speak out some numbers. You listen carefully and then repeat". If the child started repeating the numbers before the experimenter was through, he was told: "Wait until I finish. You should speak only when I finish speaking". After making sure that *S* followed the instructions *E* started two number-series and continued with a series of increasing length until the child could no longer respond. The maximum number of digits presented were five. There were three trials for the number series of each length—2, 3, 4 and 5. Different digits were presented at each trial.

### *Scoring*

For each number-series *S* was given a score of "1", if he responded correctly in at least one of the three trials, and "0", if he failed in all the three trials.

## RESULTS AND DISCUSSION

The mean immediate memory span for digits of children from ages 3 to 5 years can be seen in Table 1. The analysis of the longitudinal data indicates an increase in memory capacity during this age period, the most significant increase observed being between  $3\frac{1}{2}$  to 4 years (Newman and Kuels test for significance of difference among means  $P < .05$ ). None of the other differences between means at successive age levels is significant. A similar trend can be seen in the cross-sectional data also.

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## CHANGES IN IMMEDIATE MEMORY-SPAN

TABLE 1  
MEAN IMMEDIATE MEMORY-SPAN FOR DIGITS FOR CHILDREN  
FROM 3 TO 5 YEARS

	<i>Age in Years</i>					
	3	3½	4	4½		
Longitudinal Sample ( <i>n</i> = 15)	Mean	3.07	3.27	4.00	3.87	3.93
	S. D.	.64	.50	.86	.55	.35
Cross-Sectional Sample ( <i>n</i> = 36)	Mean	3.36	3.50	3.81	4.15	4.17
	S. D.	.69	.54	.74	.44	.52

The data were also analysed in terms of the percentage of the subject showing correct recall of number-series of increasing length (2 to 5 digits), using the criterion that the immediate memory-span for digits at any given age-group may be considered to be maximum number of digits recalled correctly by more than 50 per cent of the children at that age level, we again find that significant increase in memory-span to be between 3½ and 4 years. A similar trend can be seen in both the longitudinal and cross-sectional data.

TABLE 2  
PERCENTAGE OF CHILDREN AT EACH AGE LEVEL SHOWING  
CORRECT RECALL OF DIGITS (AGES 3 TO 5 YEARS)

<i>Number of Digits (Longitudinal data <i>n</i> = 15)</i>	<i>Age in Years</i>				
	3	3½	4	4½	5
2	100	100	100	100	100
3	73.33	86.67	93.33	100	100
4	33.33	40.00	73.33	66.67	80.00
5	0	0	33.33	20.00	13.33
<i>(Cross Sectional Data <i>n</i> = 36)</i>					
2	100	100	100	100	100
3	83.33	94.44	90.63	100	100
4	47.22	47.22	71.88	85.00	82.87
5	5.56	8.33	18.75	30.00	34.29

The finding that there is a significant increase in memory capacity between 3½ and 4 years suggests three major possibilities: (a) an increase in short-term memory capacity; (b) change with age in the ability to avoid distracting stimuli and focus attention, and (c) change in the strategies of coding and retrieval.

Miller (1956) points out in his famous article "The magical number seven, plus or minus two," that the span of immediate memory imposes

severe limitations on the amount of information that we are able to receive, process or remember. With adults the immediate memory-span seems to be around seven, though adults are able to enhance this considerably by organizing or "chunking" the information into information rich units (Miller, 1956).

The results of the present investigation indicate that there is a marked difference between the immediate memory span of young children (3 in the case of children below 4 years and 4 in the case of children from 4 to 5 years of age) and that of adults ( $7 \pm 2$ ). The normative data of this kind are especially important for planning tasks of comparable difficulty in developmental studies using children of widely varying age-groups.

As had been mentioned earlier, it is quite possible that factors other than storage capacity impose a limitation on the young child's memory performance. Summarizing the factors contributing to individual variation in memory as a cognitive process, Kagan and Kogan (1970) conclude :

One of the perplexing problems is the fact that it is still not clear whether, or to what degree, recall failure is the result of imperfect registration, deficient rehearsal, or the effect of interference on the recall processes.

Discussing the problem in the light of the high distractibility and low attention span of young children, Maccoby (1969) concludes :

It is not especially useful to think of the deficit in terms of the child's having a more limited "information processing capacity" or "memory storage capacity" in the usual meaning of these terms. Rather the problem would seem to be that the capacity the young child does have is not effectively employed.

The two observations succinctly emphasize that age differences in memory performances cannot be simply construed as due to increasing storage capacity with age. This, however, does not distract the possibility of genuine developmental changes in storage capacity. Empirical evidence on immediate memory-span especially of a longitudinal nature can be useful in two major ways : (a) by indicating the specific age period at which an increase is observed. A study of the environment factors associated with the specified age period may indicate situational factors which may account for the change, e.g. entry into nursery school; (b) by giving us a guideline regarding the age differences in information processing or storage that need be taken into account for planning learning/memory tasks of comparable difficulty for children of widely differing age-groups who form the Ss of a developmental study. Only further research

planned on the basis of these considerations can enable us to attribute the observed differences in memory-span as due to storage and/or retrieval capacity or as due to other related factors.

#### SUMMARY AND THE MAJOR FINDING

Longitudinal ( $n = 15$ ) and cross-sectional ( $n = 36$ ) data were analysed to study the developmental changes in the immediate memory-span for digits in the preschool children (age 3 to 5 years). Results indicate a significant increase in memory-span (from 3 to 4 digits) between 3½ and 4 years. This finding can be used for planning learning and memory tasks of suitable difficulty for young children in developmental studies.

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# ✓ Some Differential Personality Correlates of Low and High Achievers

## A Comparative Study

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*This study was undertaken to find out a few differential personality correlates of low and high achievers. The study was conducted on a sample of one thousand Class X students of science (Bio.) group of 12 higher secondary schools of Agra after controlling the effect of socio-economic status. The results indicated that adjustment, non-achievement and intelligence have been found to be differential personality correlates, level of aspiration did not come out to be significant, and anxiety is found to be negatively correlated with a changing role in scholastic achievement.*

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THE saddest aspect of the secondary school education in this country in general and in Uttar Pradesh in particular is the large-scale failure of students at the high school and intermediate examinations. The statistics of the pass percentage of the high school and intermediate examinations, conducted by the Board of High School and Intermediate Education, shows that it never rose above 51.38 per cent during 1960 and 1970. Sometimes it went as low as 38.9 per cent. The percentage of failure,

is, therefore, as high as 61.1. This percentage is not out of small number. About eight lakh students appear at this examination every year and more than fifty per cent of them fail. Out of the forty-five per cent who pass out, about fifty per cent of them are low achievers, who get poor third class. Such a state of affairs may be prevailing in other parts of the country also.

The number of failures is a cause of anxiety for the educationists the government and all others. A developing nation like India can ill afford such wastage. Therefore, the problem of diagnosing the causes of failure at the high school examination in U.P. and elsewhere calls for immediate remedial measures.

Therefore, an effort to unravel and understand the factors that underlie in the success or failure of students is not an academic exercise. It has its practical bearing in the sense that it makes possible the proper and full utilization of meagre resources of the country. A scientific analysis of the factors would suggest ameliorative measures which would ensure maximum academic achievement for the largest possible number.

### *The Problem*

This problem poses the following questions :

1. Why do students of average ability fail to give good performance ?
2. What are the factors associated with the success and failures of students ?
3. What are the factors which differentiate the low achievers from the high achievers ?

### *Present Status of Knowledge*

Researchers have tried to answer these questions associated with the problem of success and failure of high and low achievements. Their attempts can be classified into three broad categories

1. Intelligence as a correlate of achievement.
2. Socio-economic status, that is, parental education, profession, economic status, neighbourhood, etc. as correlates of achievement.
3. Personality characteristics of the students, their study habits, friendship patterns, etc as correlates of achievements.

The research findings in the first category are by and large definitive in nature. Most of the researchers have found that correlation coefficients between achievement and intelligence lie between .3 and .6. It means that intelligence explains only 9 to 36 per cent of the total variance in the students' achievement.

Researchers of the second category have also shown that correlation coefficients between socio-economic status and achievements range between .42 and .63, and this class of factors account for nearly 16 to 40 per cent of the total variance in achievement. There is not much disagreement among the researchers of this category.

The third category of correlates of achievement belong to the realm of personality. Personality characteristics have been considered important for success in examination. In this context remarks of Sinha (1970) are highly pertinent. He says, "Apart from minimum academic requirements, the quality of scholastic performance depends upon certain personality factors."

The view is supported by Garrett's report (1949) also, in which he says, "Although admirable progress has been made in discovering and attempting to measure the factors which contribute to scholastic success, all writers agree that there remains a unique unmeasurable factor, or perhaps many factors, lost in the unpredictable intricacies of the human personality."

In this context Thresher (1959) has rightly stated that we know very little of the psychological forces that turn one student into a purposeful worker and another into an aimless drifter.

It is perfectly natural to expect that different aspects of personality would influence academic performance either positively or negatively. It is for the researchers to find out which factors, how and to what extent influence the scholastic achievement.

Here two lines of approach are open to researchers. Either he tries to find out the personality characteristics in general which are correlated to academic achievement, or he selects a few well defined personality characteristics and examines their relationship to achievement. The first approach is apparently very unwieldy and it is suitable for cooperative, collective research only. The second approach is, however, very straight forward and suitable for individual researchers.

A number of personality characteristics have been studied in relation to achievement. For example, Bhatnagar (1967) studied need for autonomy, interperception, succorance, dominance, nurturance, endurance, aggression, defence, affiliation and abasement. Abraham (1969) studied scholastic aptitude, neuroticism and extraversion-intraversion. Rao (1963) stressed on academic adjustment, sense of responsibility, moral and neurotic difficulties. Mishra (1962) studied anxiety, judgement, neuroticism, intelligence, attitude towards the teachers' social and emotional adjustment.

Following this line of approach the researcher proposed to study the differential personality correlates of low and high achievers. By simple

logic only that personality characteristic could be a correlate of achievement with respect to which the low and high achievers differ.

*Definition of the Terms* The terms used in this title are defined below for the sake of the clear understanding of the scope and design of the study.

*Comparative Study.* This expression suggests the design of the study. In this study the chosen personality characteristics of the low and high achievers have been compared.

*Differential.* Differential means which differentiates the two groups of low and high achievers.

*Personality.* For the purposes of this study the term personality is understood as "Need, Aspirations, Abilities, Level of Anxiety, Adjustment, etc. of a person, which determine his behaviour in a given situation"

*Correlates.* The term 'correlates' means variables which are related with.

*Low Achievers.* In this study low achievers were those students who failed at the high school examination of 1972 of the Board of High School and Intermediate Education, U.P. and secured less than 40 per cent in aggregate.

*High Achievers.* High achievers were those who got first class marks and above in their high school examination.

*Delimitation of the Problem.* The study was delimited in content and sample as follows.

*Personality Characteristics.* Although there are a number of personality characteristics which may be studied as correlates of achievement, the present study was delimited to the following. 1. Adjustment 2. Anxiety 3. Level of Aspiration 4. Need-Achievement 5. Intelligence.

**SAMPLE :** The study was delimited to a sample of Class X male students of Agra city who had offered Science (Biology) group.

#### *Objectives of the Study*

The objectives of the study were as follows :

1. To find out the extent to which low and high achievers differ in respect of adjustment, anxiety, level of aspiration, *n*-achievement and intelligence.
2. To understand the relationship between the selected personality variables and scholastic achievement.
3. To establish regression equation between achievement as criterion and adjustment, anxiety, level of aspiration, *n*-achievement and intelligence as predictors.

#### *Hypotheses*

In this study the following hypotheses were tested :

- H1A* The low and high achievers do not differ significantly in their adjustment.



- H1B There is no significant relationship between achievement and adjustment.
- H2A The low and high achievers do not differ significantly in their level of anxiety
- H2B There is no significant relationship between achievement and anxiety.
- H3A There is no significant difference between the levels of aspirations of the low and high achievers.
- H3B Level of aspiration is not significantly related to achievement.
- H4A The low and high achievers do not differ significantly in their need achievement.
- H4B N-Achievement is not significantly related to the students' achievement
- H5A The low and high achievers do not differ significantly in their levels of intelligence.
- H5B Intelligence is not significantly related to achievement.
- H6 The predictors of achievement are equally important in predicting students' achievement.

### *Design of the Study*

The design of this study is *ex post facto* in nature. For the purpose of testing the deductions from the null hypotheses the students of the sample were divided into three groups on the basis of their achievement, viz.

1. High Achievers, 2. Average Achievers, 3. Low Achievers.

The three achievement groups were selected in such a way that they were equal in respect of their socio-economic status

### *Procedure*

**TOOLS .** For the purposes of this study the following tools were used for data collection .

1. Adjustment Inventory by A.K.P. Sinha,
2. Anxiety Scale by Durganand Sinha,
3. Level of Aspiration Test by M.A. Shah,
4. n. Ach. (Projective Test) by Prayag Mehta,
5. Intelligence Test by Jalota,
6. Socio-economic Scale by Kuppaswami

**SAMPLE :** On a sample of one thousand Class X students of Science (Bio) group of 12 higher secondary schools of Agra all these tests were administered by the researcher in one sitting of two hours, when the high school results were declared, the marks of these students were collected from their school offices. Then the three achievement groups

# SOME DIFFERENTIAL PERSONALITY CORRELATES

were formed and matched on the basis of socio-economic status scores. In this way three groups of 100 each were formed.

STATISTICAL TECHNIQUES USED : Frequency distribution, Mean, S. D., Correlation, *t*-test, Regression Equation, Multiple R and  $r^2$  were used for the analysis of data.

All the calculations were done by a computer using the formulae by Guilford (1965)

## Results

The study aimed at finding out the personality correlates of the low and high achievers only. The average group served as a frame of reference. Therefore, the findings about the low and high achievers only have been presented in Table 1 through 17.

### ACHIEVEMENT AND TOTAL ADJUSTMENT

TABLE 1  
MEAN, S D, N, *t* AND P FOR THE ADJUSTMENT SCORES  
OF THE THREE ACHIEVEMENT GROUPS

		H.A.	A.A.	L.A.
N		100	100	100
M		12.49	13.18	15.64
$\sigma$		6.17	7.53	7.73
$\sigma M$		.617	.753	.773
S.N.	Groups	<i>t</i>	<i>df</i>	<i>P</i>
1.	High Av.	7.09	198	N.S
2.	High Low	3.39	198	< .01
3.	Ave Low	2.27	198	< .05

### ACHIEVEMENT AND EMOTIONAL ADJUSTMENT

TABLE 2  
MEAN, S.D, N, *t* AND P FOR THE EMOTIONAL ADJUSTMENT  
OF THE THREE GROUPS

		H.A.	A.A.	L.A.
N		100	100	100
M		2.38	2.79	3.01
$\sigma$		2.50	2.84	3.07
$\sigma M$		.280	.284	.307
S.N.	Groups	<i>t</i>	<i>df</i>	<i>P</i>
1	High Ave.	1.08	198	N.S
2.	High Low	3.86	198	< .01
3.	Ave. Low	2.68	198	< .01

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## ACHIEVEMENT AND SOCIAL ADJUSTMENT

TABLE 3  
MEAN, S.D., N, *t* AND P FOR THE SOCIAL ADJUSTMENT  
OF THE THREE GROUPS

		H.A.	A.A.	L.A.
N		100	100	100
M		6.11	6.32	6.71
$\sigma$		2.92	2.88	3.20
$\sigma M$		.292	.288	.320
S.N.	Group	<i>t</i>	<i>df</i>	P
1.	High Ave.	.512	198	N.S.
2.	High Low	1.39	198	N.S.
3.	Ave. Low	.907	198	N.S.

## ACHIEVEMENT AND EDUCATIONAL ADJUSTMENT

TABLE 4  
MEAN, S.D., N, *t* AND P FOR THE EDUCATIONAL  
ADJUSTMENT OF THE THREE GROUPS

		H.A.	A.A.	L.A.
N		100	100	100
M		3.88	4.07	4.98
$\sigma$		2.68	3.28	3.40
$\sigma M$		.268	.328	.340
S.N.	Group	<i>t</i>	<i>df</i>	P
1.	High Ave.	.45	198	N.S.
2.	High Low	2.56	198	< .01
3.	Ave. Low	1.93	198	N.S.

COEFFICIENT OF CORRELATION BETWEEN ACHIEVEMENT AND ADJUSTMENT  
TABLE 5

	Total	H.A.	A.A.	L.A.
<i>r</i>	.43	.004	.081	.106
<i>p</i>	< .01	N.S.	N.S.	N.S.

### Findings

1. The high achievers differ significantly in their adjustment from the low achievers. High achievers have been found better adjusted than the low achievers.

Hence it may be concluded that the total adjustment is a differential personality correlate of low and high achievers.

2. High and low achievers differ significantly in the areas of emotional and educational adjustment, but do not differ in social adjustment.

# SOME DIFFERENTIAL PERSONALITY CORRELATES

High achievers have better emotional and educational adjustments than those of low achievers.

It shows that emotional and educational adjustment are differential in nature but not the social adjustment.

3. There is positive relationship between adjustment and scholastic achievement.

4. 18.49% of the total variance in achievement scores is accountable by adjustment.

Thus both the hypotheses H 1A and H 1B are rejected at .01 level.

## ACHIEVEMENT AND ANXIETY

TABLE 6  
MEAN, S.D, N, *t* AND *P* FOR THE ANXIETY SCORES  
OF THE THREE GROUPS

		H.A.	A.A.	L.A.
	N	100	100	100
	M	27.91	16.34	40.27
	$\sigma$	18.74	16.32	26.42
	$\sigma M$	1.874	1.632	2.642
S.N.	Group	<i>t</i>	<i>df</i>	<i>P</i>
1.	High Ave.	1.77	198	N.S.
2.	High Low	3.79	198	< .01
3.	Ave. Low	2.53	198	< .01

## COEFFICIENT OF CORRELATION BETWEEN ANXIETY AND ACHIEVEMENT

TABLE 7

	Total	H.A.	A.A.	L.A.
<i>r</i>	-.36	-.161	-.061	-.100
<i>p</i>	< .01	N.S.	N.S.	N.S.

## Findings

1. The low achievers are significantly more anxious (.01) than the high achievers. It means that anxiety is a differential personality correlate of low and high achievers.

2. Normal degree of anxiety does not appear to affect the achievement adversely. It only does, when anxiety level goes up well above the normal.

3. There is negative relationship between anxiety and students achievement.

4. 12.46 % of the total variance of achievement scores is accountable by anxiety.

Thus hypotheses (H 2A) and (H 2B) both are rejected at .01 level.

ACHIEVEMENT AND LEVEL OF ASPIRATION (G. D.)

TABLE 8  
MEAN, S.D., N, *t* AND P FOR THE G.D. SCORES  
OF THE THREE GROUPS

		H.A.	A.A.	L.A.
	N	100	100	100
	M	2.131	3.18	2.176
	$\sigma$	3.70	3.36	3.29
	$\sigma M$	370	336	329
S.N.	Group	<i>t</i>	<i>df</i>	<i>P</i>
1.	High Ave.	2.1	198	< .05
2.	High Low	.099	198	N.S.
3.	Ave Low	2.11	198	< .05

COEFFICIENT OF CORRELATION BETWEEN ACHIEVEMENT  
AND G.D. FOR THE THREE GROUPS

TABLE 9

Groups	High Ach.	Ave. Ach.	Low Ach.
<i>r</i>	-.194	-.025	-.135
<i>p</i>	< .05	N.S.	N.S.

ACHIEVEMENT AND LEVEL OF ASPIRATION (A.D.)

TABLE 10  
MEAN S.D., N, *t* AND P FOR A.D. SCORES OF THE THREE GROUPS

		H.A.	A.A.	L.A.
	N	100	100	100
	M	1.511	2.764	1.746
	$\sigma$	2.42	1.74	2.61
	$\sigma M$	242	174	261
S.N.	Groups	<i>t</i>	<i>df</i>	<i>P</i>
1.	High Ave.	4.3	198	< .01
2.	High Low	.65	198	N.S.
3.	Ave. Low	3.27	198	< .01

COEFFICIENT OF CORRELATION BETWEEN ADJUSTMENT AND A.D.

TABLE 11

		H.A.	A.A.	L.A.
<i>r</i>		-.152	-.055	-.114
<i>p</i>		N.S.	N.S.	N.S.

# SOME DIFFERENTIAL PERSONALITY CORRELATES

## Findings

1. The G.D. and A.D. are not differential personality correlates of low and high achievers.
2. The low achievers and high achievers do not differ significantly in their goal discrepancies.
3. The high achievers fix up high goal and try to achieve it, whereas the low achievers fix up low goal and they also try to achieve it.
4. There is negative relationship between G.D. and achievement.
5. The low and high achievers do not differ significantly in their A.D.
6. A.D. is negatively related to students achievement.
7. There is high positive relationship between G.D. and A.D.
8. 14.44% of the total variance of achievement scores is accountable by G.D. and 9.61% by A.D.

Thus the hypothesis that high and low achievers do not differ significantly in their G.D. and A.D. is not rejected. But the hypothesis that G.D. and A.D. have no significant relationship with achievement is rejected.

## ACHIEVEMENT AND NEED ACHIEVEMENT

TABLE 12

MEAN, S.D., N, *t* AND P FOR *n*. ACH. SCORES OF THE THREE GROUPS

		H.A.	A.A.	L.A.
	N	100	100	100
	M	8.72	5.58	4.13
	$\sigma$	8.6	6.18	5.28
	$\alpha M$	.86	.618	.528
S.N.	Groups	<i>t</i>	<i>df</i>	<i>P</i>
1.	High Ave.	2.9	198	<.01
2.	High Low	4.59	198	<.01
3.	Ave. Low	1.8	198	<.10

THE COEFFICIENT OF CORRELATION BETWEEN *n*.ACH. AND SCHOLASTIC ACHIEVEMENT OF THE THREE GROUPS

TABLE 13

	Total	H.A.	A.A.	L.A.
<i>r</i>	.37	.038	.089	.042
<i>p</i>	<.01	N.S.	N.S.	N.S.

## Findings

1. The low and high achievers differ significantly in their *n*-achievement. Hence *n*-Ach. is the differential personality correlates.
2. *n*-Ach. is positively related to scholastic achievement.

3. 13.69% of the total variance of achievement scores is accountable by *n*-Ach.

Thus the hypothesis H 4A H 4B are rejected at .01 level

# ACHIEVEMENT AND INTELLIGENCE

TABLE 14  
MEAN, S.D., N, *t* AND P FOR THE INTELLIGENCE SCORES  
OF THE THREE GROUPS

	H.A.	A.A.	L.A.
N	100	100	100
M	82.35	52.76	44.83
$\sigma$	13.87	13.13	10.64
$\sigma M$	1.387	1.314	1.064
S.N. Groups	<i>t</i>	<i>df</i>	<i>P</i>
1. High Ave.	5.06	198	< .01
2. High Low	10.18	198	< .01
3. Ave. Low	4.84	198	< .01

# COEFFICIENT OF CORRELATION BETWEEN INTELLIGENCE AND ACHIEVEMENT

TABLE 15

	Total	H. A	A. A.	L. A.
<i>r</i>	.48	.316	.487	.403
<i>p</i>	.01	.01	.01	.01

# Findings

1. Intelligence is a significant factor in determining the students' scholastic achievement.
2. Low and high achievers differ significantly in their level of intelligence.
3. Intelligence is positively and significantly related to students achievement.
4. 23.04% of the total variance of achievement scores is accountable by intelligence.
5. Thus the hypothesis H5A and H5B are rejected at .01 level.

# MULTIPLE REGRESSION EQUATION FOR PREDICTING THE ACHIEVEMENT

TABLE 16

Criteria	Predictors						Constant	Equation No.
Adjust. ment	Anxiety	G. D.	A. D.	N ACH.	Intelli. gence			
X1	X2	X3	X4	X5	X6			
High Achie- vement	+ .59 × 1	- .25 × 2	- 2.54 × 3	+ 1.49 × 4	+ .26 × 5	+ .54 × 6	+ 306.37	1
Y'H								
Ave. Ach.	+ .19 × 1	- .10 × 2	- .76 × 3	+ .55 × 4	- .17 × 5	- .75 × 6	+ 227.94	2
Y'A								
Low Ach.	- .13 × 1	- .00 × 2	- 1.88 × 3	+ 1.52 × 4	+ .15 × 5	+ .79 × 6	+ 152.45	3
Y'L								

# SOME DIFFERENTIAL PERSONALITY CORRELATES

## Findings

1. All the predictors are not equally important in predicting achievement.
2. The role of A. D. (X4) and Intelligence (X6), for each group is positive in nature but dissimilar in numerical weight.
3. The role of anxiety (X2) and G. D. (X3) is negative in nature, but dissimilar in numerical strengths.
4. The role of adjustment (X1) and N. Ach. (X5) is neither similar in nature nor in numerical strength for all the three groups.

## Multiple R

Relationship between criterion variable (achievement) and its predictors.

TABLE 17  
MULTIPLE Rs, R<sup>2</sup> AND P FOR THE THREE GROUPS

	H. A.	A. A.	L. A.
R	.37	.49	.42
R <sup>2</sup>	.1369	.2401	.1764
P	.01	.01	.01

## Findings

All the Rs are significant at .01 level and explain 13.69+24.01 + 17.64 per cent of the total variance of the achievement scores.

## CONCLUSIONS

The following conclusions have been drawn from this study.

1. Adjustment as a personality characteristic is highly significant for achievement. A well adjusted individual specially in the field of educational and emotional areas, has better chances of achieving high.
2. Anxiety as a trait of personality has changing role in scholastic achievement. Low level of anxiety helps in achieving high, whereas very high level of anxiety is detrimental to achievement.
3. Level of aspiration in itself is not a significant correlate of achievement, but it is desirable that the students fix up high goals commensurate with their ability and try to achieve it. Low goal setting is in no way a desirable characteristic for better achievement.
4. n-Achievement is prerequisite for better achievement. It drives the students into academic activities.



5. Intelligence is *sine qua non* for better achievement.
6. Adjustment, anxiety, *n*-achievement and intelligence are differential personality correlates of low and high achievers. Whereas level of aspiration is not their differential personality correlate.

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# Choice of Elective Courses of Students

## An Application of Factor Analysis

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*Many academic programmes at Indian universities and institutes of higher education offer elective courses to students. For effective improvement of the courses a need often arises to find the factors underlying the choice of these courses by the students. This paper presents a methodology for this purpose. This methodology is explained through a study conducted by the authors at the Indian Institute of Management, Ahmedabad.*

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THE Postgraduate Programme at IIM (Indian Institute of Management) is a two-year programme. All the first-year courses are compulsory and cover basic functional areas along with basic disciplines which are useful in making management decisions. The second-year courses provide an opportunity to continue to some extent the broad range of subjects and to pursue special interest to a far greater extent. All the second-year courses, with the exception of a two-term Business Policy course are, therefore, elective. A knowledge of the factors that affect the choice of these elective courses is envisaged to be of immense value to the faculty offering courses in the second year as well as the first year of the programme.

### *The Present Study*

"What makes you choose your courses?" is the title of the survey conducted to identify the principal factors that affect the choice of the

courses by the participants of the programme in the second year. Intuitively it is felt that the participants make reference to factors such as: career plan, previous background, effort required in completing the course, professor's role and image of the course. However, neither the order nor the extent of importance could be assigned to these factors on intuitive basis. Accordingly, a scientific study based on the Principal Component Method of Factor Analysis was undertaken, with the participants of the 1972-74 batch as respondents to the questionnaire discussed below, during the third term of the academic session 1973-74.

### *What is Factor Analysis ?*

Factor analysis is one of the statistical methods for the study of multivariate data. The method arose in providing mathematical models for the explanation of psychological theories of human ability and behaviour. The method has since been applied to many other areas. The chief aim of factor analysis is to attain scientific parsimony or economy of description of data.

Two aspects are relevant to the study of multivariate data, *viz.* examine the system with a view to know the underlying structure, and fit an appropriate model for the underlying structure. A simple model for the system for which  $n$  observations  $x_{ij} = 1, 2, \dots, n$  have been made on each of the variables  $x_i$  would be the structural relationship.

$$x_i = \sum_{k=1}^m a_{ik} F_k, i = 1, 2, \dots, p; m < p,$$

i.e. we assume that the variables are linear combinations of the  $m$  factors,  $F_k$ , where usually  $m$  is considerably smaller than  $p$ . The coefficients  $a_{ik}$  are called "factor loadings." Unlike a regression model, here  $F_k$  are not fixed

The model as such is undetermined, and we need to devise "rules" for determining the factor loadings  $a_{ik}$  and the factors  $F_k$ . As noted above,  $F_k$  are not observable. Several methods are now available for determining  $a_{ik}$ . For details we refer to Harman (1968), Table 6.1, p. 108, where an overview of the different methods along with their distinguishing characteristics is presented. Each of these methods assumes a criterion, e.g. maximal reproduction of correlations or maximum contribution to the sum of the variances of the  $p$  variables. The factor loadings  $a_{ik}$  are then uniquely determined by the statistical methods. For each factor the factor loadings are ranked against the variables. The major factors are

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\*The authors are thankful to Shri Z H. Gangjee with whom the second author had useful discussion on the organization of the survey. They are grateful to the PGP participants for their cooperation in responding to the questionnaire so cheerfully.

then identified together with the total amount of variation they account for. This leaves us with a model that fits the empirical data, within the bounds of accuracy embedded through the criteria set up.

The usefulness of factor analysis in empirical investigations, however, largely depends upon the investigator's success in identifying the factors with intuitively interpretable entities. The statistical analysis carried out up to this point would suggest that the system envisaged to be described by  $p$  variables can be described in terms of only  $m$  new hypothetical ones. A practical identification of the new variables (factors) requires these to be named. For this purpose sufficient knowledge is necessary of the physical systems which has generated the data. Factor analysis is a statistical tool which works as an exploratory instrument. Identification or naming the factors essentially remains extra-statistical in character, though the ranking methods come handy in carrying out this exercise.

This introduction to factor analysis as a statistical method would be incomplete without a reference to the choice of variables  $x_i$ . A rational choice of the variables in generating empirical data is no doubt the starting point of any study; and this is well appreciated. Besides the choice of variables, the question of scale also requires attention. The results of factor analysis are not invariant under change of scale. Kendall and Stuart (1968) demonstrate this point through an example of meteorological data. We will be content here by pointing out that whether scaling, e.g. standardization as is customarily the case to reduce all the variables to equal importance—is desirable or not is to be decided on considerations other than statistical.

Heavy computation work is a general characteristic of statistical analysis of multivariate data. Use of factor analysis is no exception. However, advent of electronic computers and the availability of standard codes has rendered it possible to use this technique in several areas, e.g. marketing (Dudek 1967, Green & Tull, 1973; Mukherjee, 1965 and Steetzel 1960) meteorology (Kendall & Stuart, 1968) and motor insurance. The (Johnson & Hey, 1971) bibliography in Harman (Harman, 1968) includes references to many more applications of factor analysis to other areas, e.g. medicine, urban systems and economics.

#### *The Questionnaire*

Eighteen variables were devised to get information. A list of these variables is given in Exhibit 1. These were randomly arranged in the questionnaire and put in the form of a booklet instead of a single sheet to ensure to a great extent mutual independence in the scoring of various variables by a respondent. A six-point scale was provided to avoid 'central-tendency' on the part of the respondent. It was decided to administer the questionnaire to all the participants on the campus during

EXHIBIT 2: INTER-CORRELATIONS AMONG THE 18 VARIABLES

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.	1.000																	
2.	.2147	1.0000																
3.	.0321	.2261	1.0000															
4.	-.0279	-.0989	-.1516	1.0000														
5.	-.0736	.1358	-.1051	.4704	1.0000													
6.	-.1179	-.1035	-.0376	-.0407	.0611	1.0000												
7.	-.0954	-.0272	-.2370	-.1147	-.2054	-.0513	1.0000											
8.	-.0076	.0459	-.1338	-.0074	.0958	-.1263	.3440	1.0000										
9.	-.1418	-.0677	-.0909	.3513	-.2415	.0025	.1449	.1888	1.0000									
10.	.0403	-.1954	-.0595	-.1753	-.2275	-.1334	.0885	-.1788	.0488	1.0000								
11.	.0204	-.0844	-.0105	-.1356	-.1290	-.1487	.2524	-.3435	-.0525	-.2034	1.0000							
12.	-.0000	-.0419	-.0720	-.2091	-.3278	.0998	.0076	-.0332	-.0517	-.1572	-.1581	1.0000						
13.	-.0903	-.0358	-.2668	-.3866	-.1976	-.1347	-.1452	-.1649	-.1915	-.1466	-.0291	.2147	1.0000					
14.	.2310	-.2890	-.1139	-.0292	.2151	-.1774	.0693	.1825	.1863	-.0706	-.2416	.1285	-.2081	1.0000				
15.	-.0989	-.0713	-.0236	-.1724	-.2202	-.1021	.1802	-.2419	.1619	-.2558	.2607	-.0894	.3269	-.1974	1.0000			
16.	-.0869	-.1373	-.0417	-.0084	-.0662	-.1966	.0621	.0952	.1665	.0655	-.1545	-.0021	-.0722	.1016	-.0006	1.0000		
17.	-.2007	-.1310	-.1595	-.0984	-.0474	-.0003	-.1100	.1025	-.0390	-.0124	-.2000	.0904	-.0849	-.4349	-.0363	.2310	1.0000	
18.	-.0259	-.2486	-.0069	-.1375	-.2406	-.0806	-.1345	-.3496	-.1390	-.0313	-.2986	-.1249	-.1522	.4112	-.0279	.2201	-.2843	1.0000
Mean	5.33	3.18	1.80	2.51	3.20	4.76	2.58	4.18	3.38	3.33	3.70	3.07	2.18	4.88	2.99	3.90	5.46	4.59
Var-																		
iance	.5111	1.6351	.9378	1.6943	1.6045	1.2069	2.3106	1.8351	1.6351	2.3778	2.3211	2.1511	1.8945	9739	1.8554	2.0456	.6036	.997

# EXHIBIT 3 - RANKING OF FACTOR ANALYSIS

Rank for the Various Factors

S. No	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1.	Future need for the type of skills and/or knowledge	18	11	16	9	3	1	6	8	18	1	12	15	7	8	6	6	9	—
2.	Seniors' acclamation about the course	13	10	18	3	78	14	7	17	15	16	9	14	12	14	13	18	15	—
3.	Friends are taking the course	17	4	14	1	18	13	2	2	5	6	7	4	16	7	12	1	3	—
4.	Number of examinations and quizzes	11	1	10	6	4	15	10	14	7	13	2	13	13	2	7	8	18	—
5.	Professor's attitude and grading policy	1	3	8	10	6	16	11	12	12	15	5	17	1	4	15	9	1	—
6.	Your ability to gain the skill and/or knowledge	16	12	6	11	2	6	1	4	10	17	8	10	11	6	4	16	11	—
7.	Title of the course	5	9	2	2	12	5	12	1	9	4	4	7	5	12	11	17	6	—
8.	Chance of a better job	6	15	1	7	7	9	17	13	14	12	3	12	17	17	8	2	12	—
9.	Amount of project work	9	5	11	4	1	3	18	11	4	11	18	2	10	9	14	13	5	—
10.	Level of abstraction of the course material	8	8	5	14	11	10	3	18	17	9	6	1	3	10	3	5	7	—
11.	Prospective employers expect you to have taken the course	2	17	4	12	15	12	8	9	8	3	15	11	8	1	18	12	17	—
12.	Subjective probability of succeeding in the course	10	7	7	17	8	18	5	6	16	2	14	6	14	18	16	14	10	—
13.	Time schedule for the sessions	12	2	12	16	16	4	14	5	3	7	11	8	6	13	2	11	16	—
14.	Professor's effectiveness in handling the course	3	13	15	13	13	7	13	3	13	18	13	5	2	15	17	3	14	—
15.	Effort required in organizing the course material	4	6	3	15	14	2	9	16	6	14	17	18	18	11	5	7	4	—
16.	Past training and/or specialization	14	14	13	8	5	11	4	15	1	3	10	16	4	16	10	4	13	—
17.	Your own career plan	15	16	17	18	9	8	15	10	2	8	1	3	15	5	9	15	2	—
18.	Your own experience about the subject	7	18	9	5	10	17	16	7	11	10	16	9	9	3	1	10	8	—

# BOOK REVIEWS

## *Training, Recruitment and Utilization of Teachers in Primary and Secondary Education*

Organisation for Economic Cooperation and  
Development, Paris, 1971, pp 471. Price £ 2.30

THE PROBLEM of training, recruitment and utilization of teachers has been generated because of the imbalances in the demand and supply of manpower in the educational services. This imbalance is due to both quantitative and qualitative aspects of growth in education. Quantitative expansion of education due to "demographic factors", "enforcement of compulsory education" and "sweeping changes in the structure and content of education" has resulted in much larger demand for teachers. Qualitative growth of education also demands for a new identity of teachers who will help "to give individuals a wider personal independence throughout their life, enabling them to understand their environment, to communicate with and master it". On the contrary, the supply was hampered due to the pre-war and post-war situation, "unreliable statistics on teacher stock", "demographic wave" and "lack of financial resources".

The problem has been dealt with under three parts. Part One comprises "The Characteristics and Shortcomings of Teacher Supply (1950-1965)". Part Two deals with "Teacher Recruitment and Utilization Policies". In the third part, "The Change in Teacher Training Standard" has been the subject. These three parts of discussions has been preceded by a sizeable summary and conclusion of the study and a general introduction. The general introduction gives the layout of the report including its aims, scope and methodology. . .

Looking into the past, present and foreseeable future trends in growth of education, the problem as it stands is crucial and universal. It has rightly deserved the attention. OECD as an organization has the facility of access to the statistics of its member countries, has the knack to identify problems which are more central and also has the expertise to deal with this type of problem. The planning of manpower requirements in sectors other than education is a commonly occurring phenomena in almost all the countries in the world. The typical "residual approach" to education as a sector contributing to national development has so far stood on the way to draw attention of the planners at the national level in most of the countries. Further, the absence of a comparative study on this problem has helped in misconceiving the magnitude and local character of the problem. The present study on the OECD member countries will, hopefully, create an awareness of the magnitude and universality of this intriguing problem of teacher requirement in the concerned communities all over the world.

This study has assumed both quantitative and qualitative character, "perhaps to a greater extent than previously". Quantitative character is marginal but evident in the balance sheet of demand and supply of teachers at both primary and secondary education. The qualitative character is more affluent in this study when it deals either with the characteristics and shortcomings of teacher supply, or the teacher recruitment and utilization policies, or the change in teacher training standard. In view of the wider social context of this problem, the qualitative treatment of the data has been rightful here. Moreover, due to the variance amongst the OECD member countries in their educational structure, and immediate national problems, a simple quantitative-comparative approach would have been of limited utility if not very very marginal. Further, in order to synthesize the convergent characteristics of the different countries it was, in fact, essential to give a qualitative treatment.

The data base of the present study has been built in two steps. In the first step, the national report for each country was prepared on the basis of published and unpublished documents. In the second step this national reports have been analysed to synthesize the common elements and trends of the problem. This two-stage process using record analysis has the advantage of time and ease of working. But it is susceptible to certain inaccuracies due to "processing" and different patterns of sampling and instrumentation that might have been used in developing the documents in different countries. Again, in view of the advantages, the present method is a right choice provided the present report is supplemented with the reading of national reports as it has been suggested in this book also (p. 53). Moreover, with adequately careful processing it is possible to



maintain the validity of finding. Hopefully, the OECD experts have been cautious throughout.

Although the book is on the problem of training, recruitment and utilization of teachers, its centre of gravity is "Change". The problem of sweeping change made, or to be made in the educational systems implies recruiting teachers who must satisfy different criteria from "elite oriented traditional system in order to fulfil the new functions competently and dynamically and help education to function more efficiently". The penetrating and deep analysis of the problem of imbalance and probable measures should be able to draw attention of the educational planners in almost all the countries to prepare the basic data on teacher requirements; and it is likely to influence the policy-decisions pertaining to the teacher recruitment and training. Besides the OECD member countries, in view of the much higher educable potential in the developing countries due to the prevailing huge illiteracy and low literacy, the book is likely to draw a larger audience from the developing countries, especially who are striving for a better future and reduce their gap with advanced countries. Even otherwise due to the universal character of the problem, the scientific analysis and practicable solutions, the book will be useful to the decision-makers and students of education as a discipline

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### *Research in Science and Mathematics Education*

Edited by V. N. Wanchoo and T. N. Raina, Regional College of Education,  
Ajmer, 1976, pp. 122. Price Rs. 7-00

PROBABLY one of the main functions of education in future will be improvement of the quality of life for social betterment. The present educational effort at the national level popularly known as 10+2+3 is an indication of such a future educational pattern. It can certainly be said that the contemporary education has moved closer to modern science. Such education will not only sharpen the intellectual abilities or rational powers of children but will educate and humanize them. These things are yet to come and relevant research may well become instrumental in achieving these aims.

The publication of *Research in Science and Mathematics Education* (1976) is an effort in this direction. This monograph presents a comprehensive analysis of the status studies and trends in science education research in India.

The monograph under review systematically organizes, classifies, and analyses research in science and mathematics education done at the M. Ed. and Ph. D. levels at different colleges of education and in different Indian universities.

The monograph can be conveniently divided into two parts for the purpose of review. The first part includes an analysis of research in different areas of science education, namely, mathematics education, science curriculum, methods of teaching science, instructional materials, evaluation, and science teacher education. It covers the first 69 pages of the monograph. The second part contains references and titles of the researches on which the research analysis has been done in the first part. It is an exhaustive list of 263 studies in science education and 335 studies in mathematics education.

The book contains eight papers in Part I. The first paper on "Research in Science Education: A Point of View" discusses many vital and relevant points related to science education such as the communication gap among the researchers; duplication of studies, methods of research used in India; and different dimensions of school education. Any research must cautiously consider these aspects at the time of doing research.

The next six papers present an analysis of research. These give status situation of research in those particular areas and pinpoint the research gaps, and suggests new areas of research. These problems presented in these papers provide an opportunity to the researcher to delve deep into the practical and recent aspects of science education research. The analysis of research has been crystallized by a team of science educators thrice before being presented in its final form to the readers. The last paper gives ten suggestions for the improvement of science education research.

In India, very little work has been done in the field of science education and in some areas it assumes the dimensions of an intellectual famine. Under such situations this monograph is much needed material for the researcher in science education. As far as this reviewer knows this publication is one of its own kind in India after the publication of *Mathematics and Science Education in Indian Schools* (1965), and *Science and Mathematics Education in Indian Schools: Report of Unesco planning Mission* (1964). Further, this publication being purely based on research analysis departs significantly from publications of similar kind. Such publications come only after long, dedicated efforts. The book will serve as a reference material for the researchers. Hence, it is a must for

science educators, colleges of education or university departments of education.

The chapters are written in a clear and concise style and organized in such a way as to provide a wealth of information concerning the six different areas of research in science education. Each chapter provides a list of needed research which will be helpful in selecting the research problems.

The monograph is presented in a very readable manner and appropriate samples of the data are effectively used to support the analysis given. The eighth paper on "A Few Suggestions" presents a list of ten suggestions for the improvement of science education research. The suggestions are related only to the implementation stage. One would have, however, preferred a synthesis of all the six papers to get a gestalt view of science education research in India and its linking with the first paper to delineate the future needs. Secondly, there was a need of an elaboration of some of the research problems or presenting a few strategies of science education research.

Research plays a dominant part in changing the direction of the wind. Today, there is a need to create a new type of intellectual ferment in science education related to :

- the nurturing of talent,
- the sociology of science for avoiding further disjunction between science and society,
- the value-oriented science education in the schools, and
- the development of teaching strategies and teaching styles.

Science education research should match with the developmental programmes, operational programmes, and action studies in different areas of science education. The reviewer feels that science educators should help in coordinating and directing research work at post-graduate level over a considerable period which in turn would emerge as a coherent study of a series of related problems. This will be helpful in establishing appropriate frames of reference and a theoretical basis of science education research to avoid haphazard and fragmented research attempts. It is essential to "establish more concisely a theory of science teaching, a philosophy, a rationale or point of view".

The reviewer strongly feels that the present team of science educators, who could produce this monograph, will definitely present a parallel work to *Curtis Digest*, or *Reviews of Research in Science Education*, as produced by the Teacher's College, Columbia University. The expectations go further to match the work with that of ERIC Science and Mathematics Information Analysis Centre functioning at the Ohio State University.

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# Classroom Interaction Behaviour of Teachers' and Students' Mental Health

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SINCE 1930s when researches in educational psychology started gaining momentum, psychologists and educationists started concentrating their efforts. While to answer the question of what makes a teacher effective, the researchers tried to find answers to this question on variables such as teacher personality, education, age, experience, sex, socio-economic background, etc., they could not agree upon a unified criteria on which to evaluate the effectiveness of the teacher. Later on, more reliance was put on whether students secured more marks or not in the subject taught by the teacher. Gradually, the importance of the teacher in shaping the personality of the student was realized; student performance in the examinations being only a part. Thus the expert committee on the criteria of teaching effectiveness appointed by the American Educational Research Association (1952-53) stated that teacher effectiveness must ultimately be defined in terms of effects on pupils, more specially, of changes in behaviour. Thus a teacher could be judged to be effective or not on the basis of what his students *are* after interacting with him for over

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\*The research findings reported here are based on a research project supported by the Indian Council of Medical Research when the authors were at the National Institute of Health Administration and Education, New Delhi.

a period of time *minus* what they were before they came in contact with him.

Since the time this dictum has been accepted, a number of investigators have attempted to identify those aspects of the behaviour of the teacher which have desirable impact on students in shaping their personality, and those which develop in turn undesirable characteristics in students.

Gage (1965) after reviewing the research literature on education done prior to 1965 presented five global characteristics of teachers that appeared to be the components of effective teaching. These include warmth, cognitive organization, in directness, orderliness, and problem-solving ability.

As far back as 1935, a study by Johnson (1935) indirected that positive, directive, and approving verbal communication by teachers to pupils ensured a greater degree of complying with requests and directions by learners, as compared with directions or requests to learners that were negative, non-specific and reproving.

The studies by Anderson and his co-workers (1945-46) tended to demonstrate that the teachers classroom personality and behaviour influenced the behaviour of the children she taught. Teachers who used dominative techniques produced in their pupils aggressive and antagonistic behaviour which were expressed toward both their teachers and their peers. On the other hand, the teachers, who used socially integrated behaviour appeared to facilitate friendly, cooperative, and self-directed behaviour in the children.

The famous study on relative effectiveness of democratic, authoritarian and *laissez faire* styles of leadership by Lewin, Lippit and White (1939) demonstrated, besides other things, that group members in a democratic social climate were more friendly to each other, showed more group-mindedness, were more work-minded, showed greater initiative, and had a higher level of frustration tolerance than members in the other groups. In the same study it was also found that different leaders playing the same kind of leadership role displayed very similar patterns of behaviour and the group members reached to the same kind of leadership style in the strikingly similar and consistent fashion.

In another study, Flanders (1949) found that demanding, directive, and deprecating teacher behaviour resulted in withdrawal, apathy towards the achievement problems, aggressiveness, and hostility on the part of the students of these teachers, while the problem-oriented and learner-centered teacher behaviour elicited less inter personal anxiety, more problem-solving behaviour, and a greater degree of emotional integration.

The studies by Rehage (1948) and Perkins (1948), though in different

directions, substantiate these findings in favour of democratic teacher being effective.

In an interesting study on teacher's and pupil's perception, Gage and Suci (1951) found that pupils' favourableness to teachers depended on the accuracy of teacher's social perception of pupil.

Flanders (1969) in his review of different researches on teacher effectiveness has cited these studies supporting his own research on indirect influence by the teacher (i.e., making use of the ideas and opinions of his students). He states "it can now be stated with high confidence that the per cent of teacher statements that make use of ideas and opinions previously expressed by pupils is directly related to average class scores on attitude scales of teacher attractiveness, liking the class, etc., as well as to average achievement scores adjusted for initial ability" (p. 11).

Flanders (1965) found this relationship consistently in four of his studies conducted on about 51 teachers. In these studies teachers' making use of the ideas expressed by students (assessed by Flanders' observational technique) was related to constructive pupil attitudes as well as student achievement. Morrison (1966) with 30 Grade VI teachers, Lashier (1965) with 10 teachers and 239 pupils of Grade VIII classrooms and Pankratz (1967) also found similar results.

In another study Johns (1966) found that pupils exposed to teachers who made more use of Flanders' Category 3 had not only positive attitudes but were also asking more thought-provoking questions to teachers. Similar results were obtained by Dodi (1966) and Parakh (1965).

Flanders (1963) during on inservice training project for classroom teachers found that these adult pupils exposed to an instructor who reacted more often to their ideas and opinions developed perceptions of greater independence and self-direction and had higher measures of work-output as compared with the contrasting treatment.

In a questionnaire study (without making use of observation) Cogan (1963) found significant and positive correlation between pupils' perception of the importance of their ideas and opinions in classroom decision-making with their work-output.

Miller (1964) in an experimental study found that students of responsive type of teachers had more positive attitudes and showed higher levels of thinking than the pupils of directive type teachers.

Three studies, however, did not find any significant relationship between teachers' making use of student ideas and student achievement and attitudes : Snyder (1966), Guggenheim (1961), and Hoover (1963).

Reed (1961, 1962) and Dollins, *et al.* (1962) have produced evidence of positive relationship between teachers' behaviour of praising and encouraging the students and positive student attitudes and achievement.

Furst (1967) found that the high achieving classes differed from the



low, by having more responsive teacher behaviour, less teacher talk and more extended pupil talk.

All these studies listed above indicate directly or indirectly that the teacher behaviour in the classroom determines to a great extent how much of impact he is going to have on his students and in what directions. These studies also suggested that democratic or integrative teachers produce students with comparatively high achievement and good personality characteristics than the teachers who show authoritarian or domineering behaviour. Specially the studies by Flanders and Anderson have repeatedly shown this result for American culture. Another notable point in these studies is that most of these studies were conducted on adolescent students, and high school teachers.

Studies on pre-adolescents in elementary schools are very few, and none in India, although at the pre-adolescent stage personality can be shaped to a very great extent, and the teacher interacts with him for a major part of his pre-adolescent life. The current study attempts to provide some clues to these unanswered problems.

### *Objectives*

With this background the present study aimed at investigating the impact of classroom verbal behaviour of primary school teachers on the personality of pre-adolescents.

### *Methodology : Instruments Used*

The classroom behaviour of teachers has been a subject of study by a number of researchers in the past. Flanders' Interaction Analysis Technique (Flanders, 1970) is a most popular method of studying classroom teacher behaviour. A number of studies have appeared in the past few years using this method. In this technique a trained observer sits in the classroom and keeps coding the verbal interaction between the teacher and the students into 10 pre-determined categories at every three-second interval. Seven of these categories deal with teacher talk, two with student talk and one with silence and confusion. Of the seven categories of teacher talk the four deal with indirect influence behaviour (including accepting the feelings encouraging accepting ideas and questioning) and the three deal with directive behaviour (including lecturing, directing and criticizing). Details of this system have been presented elsewhere (Pareek and Rao, 1970). On the basis of the observations by a trained observer over a specified period of time, the percentage of the use of each category of behaviour by the teacher can be computed. Besides, the

extent to which the teacher uses indirect-influence statements as contrasted with the direct-influence behaviour statements can be computed. In the original system of Flanders I/D ratios denote the indirect-influence behaviour *versus* the direct-influence behaviour ratios. These are nothing but the number of times the four indirect-influence categories (accepting feelings, encouraging, accepting ideas, and questioning) are used divided by the number of times the three direct-influence categories (lecturing, directing and criticizing) are used. Flanders also used i/d ratios after removing 'questioning' from 'I' categories and 'lecturing' from 'D' categories. T/S ratios indicated the proportion of teacher talk to the student talk during the period observed.

The student personality was assessed using the battery of pre-adolescent personality tests developed by Pareek, *et al.* (1970). This battery of tests measured adjustment of the student to school, peers, teachers, home and general, classroom trust, initiative, dependency and activity level.

The adjustment was defined as the individual's orientation towards his parents, teachers, peers school and himself, in terms of the satisfaction he derives from his interactional relationship with these significant others and himself. A 40-item Pre-Adolescent adjustment Scale (PAAS) was used to measure the adjustment of the students. This scale gave six scores of adjustment. These included : adjustment towards home where the scores could range from +10 to -10 ; adjustment to schools, peers and teachers where the scores in each could range from +6 to -10 ; adjustment to self where the scores could range from +6 to -6 and an overall adjustment index which is a total of the scores on the above five areas with the possible range of +34 to -46. In each case negative scores were taken to indicate mal-adjustment and positive scores adjustment.

Dependency was defined as the tendency to seek the help of others in making decisions or in carrying out difficult actions. A 10-item dependency scale (Pre-Adolescent Dependency Scale=PADS) was used to measure dependency.

Classtrust was defined as the tendency on the part of the student to trust his teacher and his class fellows in his daytoday classroom problems. This was assessed through a Pre-Adolescent Classroom Trust Scale (PACTS) which a semi-projective technique describing 8 situations.

Initiative was defined as the tendency to start actions independently. Such independence may or may not involve originality. A Pre-Adolescent Initiative Questionnaire (PAIQ) with six open-ended situations and questions was used. A Pre-Adolescent Activity Level Scale (PAALS) was used to assess the activity level of students. In this test the teachers rated their students on a 9 point scale of activity. Besides these battery of tests, the pre-adolescent reactions to frustration were assessed using Pareek's

adaptation of the Resenzweig's picture frustration test (Pareek, 1959). Mehta's (1962) group test of intelligence was used to measure the intelligence levels of the students. Sociometric structure of the classrooms were studied through a sociometric scale requiring students to indicate their preferences for each other in the class. These tests have been standardised (Pareek, *et al.* 1970).

### *Sample*

Fifty primary and middle schools situated in Delhi and run by the New Delhi Municipal Committee and Delhi Municipal Corporation were selected. These schools included 23 boys' schools, 13 girls' schools and 14 co-education schools. The schools were randomly chosen from each area after selecting a few geographical areas with similar socio-cultural and economic background. From each school one section of the Class V students was selected randomly. The number of children studied from the 50 classes were about 1,700. However, as some students did not compete all the tests, or have indicated lack of understanding, the total number available differs from test to test.

All the 50 teachers were observed and their interactions analysed. Each teacher was observed for three different 30-minute periods on different days.

### *Hypotheses*

Based on the review of research the following hypotheses were set up to be tested in this study.

1. These teachers who show high I/D ratios in the classroom (by making more indirect influence attempts than direct influence attempts) will tend to have better adjusted students (particularly better adjusted towards the school and the teacher) than those teachers who show low I/D ratios in their classroom interactions (by using more direct influence attempts).
2. Teachers with high I/D ratios will tend to have students with better intelligence, than the teachers showing low I/D ratios in their classroom behaviour.
3. Teachers with high I/D ratios will tend to have students who are less dependent than those teachers who show low I/D ratios.
4. Teachers with high I/D ratios will tend to have students who show high classtrust than those teachers with low I/D ratios.

- 5 Teachers with high I/D ratios will tend to have students who take more initiative than those teachers with low I/D ratios.
6. Teachers with high I/D ratios will tend to have more integrated and cohesive classroom than those with low I/D ratios.
7. Teachers who use high I/D ratios will have (or will tend to rate) their students high in activity level than those teachers with low I/D ratios.
8. Teachers using high I/D ratios will tend to have students who are :
  - A. Less extra-punitive than the students of low I/D teachers.
  - B. More impunitive and intropunitive than the students of low I/D teachers.
  - C. Less ego-defensive than the students of low I/D teachers.
  - D. Show about equal amount of obstacle-dominance reactions as the students of low I/D ratio teachers.
  - E. More need-persistent than the students of low I/D teachers and
  - F. Show less conformity to expected patterns of reactions to frustration, and show more flexibility as revealed.
9. The associative value of the teacher behaviour with student mental health variables given above will be much more when content area is controlled (i.e. when I/D ratios are used) than when the content area is not controlled (i.e. when I/D ratios are used). And in both cases the direction of association will be the same.
10. Those teachers who talk more will have the similar effects on student mental health as those teachers who have low I/D and i/d ratios.

The rationale behind the hypotheses are discussed along with the results wherever appropriate.

To test the above hypotheses the teachers with the highest (10 to 12) I/D ratios and the teachers with the lowest (10 to 12) I/D ratios were selected after computing the I/O ratios for all 50 teachers. The itemwise responses as well as the total scores of the students on the personality tests belonging to the classes taught by the above two categories of teachers were compared using 't' ratios, chi-squares and other statistics. Similar procedures were followed to test the hypotheses related to i/d ratios and T/S ratios.

## RESULTS AND DISCUSSION

### *Teacher Behaviour and Student Adjustment*

*I/D ratios of teachers and adjustment of students.* To test the hypotheses that teachers with high I/D ratio tend to have better adjusted

students than the teachers with low I/D ratios, 10 teachers with the highest I/D ratios and 10 teachers with the lowest I/D ratios from the 50 teachers studied were selected. The class-adjustment scores of classes taught by these teachers was found out by calculating average adjustment (overall) score of students in each class. Means and 't' ratios to test the significance between the means were calculated between the class adjustment scores of teachers with high I/D ratios and low I/D ratios. The means of the class-adjustment scores for high I/D ratio teachers was found to be 14.19 and for the low I/D ratio teachers it was 14.47. The mean difference is negligible.

While this suggested that students in the classrooms taught by teachers with high I/D ratios do not differ from the students of the classroom taught by teachers with low I/D ratios on the *total adjustment score*, the possibility of the differences in adjustment of these students towards the teacher and the school are not ruled out.

To test this relationship, chi-squares were calculated between area-wise adjustment of students and I/D ratios of teachers. For this purpose  $2 \times 2$  contingency tables were used with students of high I/D and low I/D teachers forming one dichotomy and positive (+) and negative (—) scores another dichotomy. The positive and negative scores were chosen specially to see how many adjusted and maladjusted students the high I/D and low I/D teachers each had in their classrooms. Chi-square was also calculated for the total adjustment scores to see the association with overall adjustment/maladjustment and teacher behaviour. The  $2 \times 2$  tables for these variables are presented in Table 1.

From Table 1 it may be observed that none of the area-wise chi-squares are significant. The percentage of students taught by low I/D teacher getting positive adjustment scores were as many as those students taught by high I/D teachers. This suggests that area-wise adjustment of students as measured by the tests developed in this study was not influenced by the Indirect/Direct type of behaviour the teacher showed in the classroom.

However, there appears to be a bit of association between total adjustment/maladjustment of students and Indirect/Direct classroom behaviour of teachers. As can be seen in the last three rows of Table 1 percentages of maladjusted students among those taught by dominative (low I/D) teachers was almost double that of those students taught by integrative type (high I/D) teachers.

This observation supports to some extent the hypothesis set up earlier. However, the observation is valid to the extent of classifying the students into adjusted/maladjusted categories, and this relationship may not stand if we consider the class averages, since low I/D teachers may be having high variability, classes on adjustment scores.

CLASSROOM INTERACTION BEHAVIOUR

TABLE 1

2x2 CONTINGENCY TABLES TO TEST THE ASSOCIATION BETWEEN  
INDIRECT/DIRECT INFLUENCE BEHAVIOUR OF TEACHERS AND  
ADJUSTMENT OF STUDENTS IN DIFFERENT AREAS

	<i>No of students of High I/D teachers</i>	<i>No of students of low I/D teachers</i>	<i>Total</i>	<i>Whether chi square is significant at .05 or .01 level</i>
No of students having '+' scores on Home Adj	236	252	488	not significant
No of students with '-' scores on Home Adj	16	22	38	
Total	252	274	526	
No of students with '+' scores on School Adj.	150	159	309	not significant
No. of students with '-' scores on school Adj.	80	105	105	
Total	240	264	414	
No. of students with '+' scores on Adj. to Peers	199	200	399	not significant
No of students with '-' scores on Adj. to Peers	51	71	122	
Total	250	271	521	
No of students with '+' scores on Adj to teachers	189	186	375	
No. of students with '-' scores on Adj. to teachers	57	68	125	
Total	246	254	500	
No of students with '+' score on general Adj.	227	242	469	not significant
No. of students with '-' score on general Adj.	17	24	42	
Total	244	266	511	
No. of students with '+' scores on Total Adj	229 (92.3 %)	241 (86.0 %)	480	Significant at .05 level
No. of students with '-' scores on Total Adj.	20 (7.7 %)	39 (14.0 %)	59	
Total	249	280	539	

Since the results obtained so far did not reveal any significant trends, the itemwise responses of the students taught by high I/D teachers, and low I/D teachers were compared for deeper analysis. The percentage of students taught by high I/D teachers and low I/D teachers answering 'yes' to each item of PASS were calculated for this purpose and are presented in Table 2.

TABLE 2  
ITEM-WISE PERCENTAGES OF STUDENTS TAUGHT BY  
TEACHERS WITH HIGH I/D RATIOS AND LOW  
I/D RATIOS CHECKING EACH ITEM ON PAAS

<i>Item No.*</i>	<i>Scale Value</i>	<i>Percentage of students checking the item</i>	<i>High I/D teacher classes</i>	<i>Low I/D teacher classes</i>	<i>Whether 't' ratio for the percentage difference is significant at .05 level</i>
<b>Adjustment to teacher</b>					
	9	+3	84.7	78.3	.05 level
	12	+2	85.8	78.0	.02 level
	8	+1	60.9	61.9	not significant
	9	0	82.5	82.5	not significant
	39	-1	40.9	40.7	not significant
	40	-2	61.7	62.2	not significant
	26	-3	22.6	26.9	not significant
	27	-4	12.8	22.4	.01 level
<b>Adjustment towards school</b>					
	22	+3	95.2	88.4	.01 level
	23	+2	78.8	75.7	not significant
	25	+1	46.7	49.2	not significant
	24	0	47.8	48.1	not significant
	20	-1	50.0	50.0	not significant
	11	-2	29.6	38.1	.05 level
	28	-3	33.6	34.3	not significant
	2	-4	59.1	51.5	not significant
<b>Adjustment to Peers</b>					
	17	+3	90.5	86.2	not significant
	38	+2	72.6	68.6	not significant
	36	+1	91.6	87.3	not significant
	20	0	89.4	83.6	.05 level
	6	-1	60.2	56.3	not significant
	7	-2	32.5	31.3	not significant
	18	-3	24.4	30.6	not significant
	21	-4	20.8	26.9	not significant

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Adjustment to Home					
30	+4	93.1	88.4	not significant	
14	+3	94.2	83.9	significant at .01 level	
13	+2	89.8	82.1	significant at .01 level	
4	+1	47.4	63.8	—do—	
31	0	78.1	67.2	—do—	
3	—1	35.0	45.1	.02 level	
15	—2	27.0	20.1	not significant	
32	—3	38.7	37.8	not significant	
1	—4	17.1	11.6	not significant	
General Adjustment					
38	+3	96.0	85.8	.01 level	
34	+2	83.6	74.2	.01 level	
29	+1	82.1	81.0	not significant	
35	0	73.7	64.2	02 level	
37	—1	35.4	41.8	not significant	
19	—2	13.5	15.7	not significant	
16	—3	48.2	36.6	.01 level	

(See Pareek, Rao, Ramalingaswamy and Sharma, 1970 for the items)

Table 2 reveals the following observations :

About 7% more of the students taught by teachers with high I/D ratios felt that their teachers listen to them patiently and encourage them in their studies, as compared with the students taught by low I/D ratios (Items 5 and 12). This clearly indicates the favourable reactions the indirect influence type teachers elicit from their students. This is further supported by the observation that the percentage of students who said that they will be happy if their teacher is transferred was more in classes taught by domi-native teachers and almost double the percentage of students of classes taught by indirect type of teachers (Item 27) who said so. Responses on the rest of the items are not significant but the percentage differences are in support of the same trend. From this it can be concluded that teachers with high I/D ratios tend to have students with more positive attitudes towards them than the students of low I/D teachers (at least in the sample studied). About 7% of the students of high I/D ratios teachers said that they go to school daily. This may be again an attitude due to the teacher (Item 22).

While comparatively more number of students taught by high I/D teachers showed high adjustment towards home on items 13 and 14, the trend is reversed in items 4 and 31 in which less number of these students



showed adjustment as compared to the students taught by low I/D teachers. The item content of both these items reveal that more number of students taught by high I/D teachers felt that their freedom at home is restricted. This may be because they are exposed to teachers on one side who do not restrict their freedom in the school and naturally after such an exposure they tend to compare their parents with teachers and evaluate their parents negatively. By the same reasoning students exposed to domi-native teachers tend to evaluate their parents more positively. The rest of the observations are not significant to the hypothesis in question, and the percentage differences described above, though significant are not very high as to suggest a high relationship. The hypothesis with regard to I/D ratios and adjustment set up in this study can be retained for further light to be thrown on this problem.

*i/d ratios of teachers and adjustment of students.* Since I/D ratios take into consideration questioning and lecturing category which are related to contents of teaching, we may expect the relationship between the teacher behaviour and student adjustment to be further sharpened in support of the indirect influence of teachers. However, the results observed in this section of the study have brought out more sharpened relationships between the teacher behaviour and student adjustment but surprisingly in negative direction to the expected. The negative results observed in this section could be interpreted in many ways and all such interpretations would again remain hypothetical. Only a few logical interpretations of these negative results have been attempted based on the data available in this study itself.

To test whether the students of high i/d teachers differ in their adjustment (total) scores with the students of low i/d teachers, 't' ratios have been calculated to test the significance of difference between the class-adjustment scores of classes taught by the teachers with 12 highest i/d ratios and the 12 classes taught by teachers with 12 low i/d ratios from the sample studied. When the 12 teachers with the highest i/d ratios and the 12 with the lowest i/d ratios were selected, two of the teachers who had the highest I/D ratios also had the highest i/d ratios and hence their classes were included. At the same time 2 more teachers who had highest I/D ratios had the lowest i/d ratios (as they were using many questions in class) and hence were included in the low i/d group. Similarly 3 teachers who had the lowest I/D ratios, had highest i/d ratio as they used more lecturing and less questioning, and they had to be included in high i/d category. The mean of the adjustment scores (total) of the classes taught by high i/d teachers was found to be 13.53, and the mean of the total adjustment scores of the classes taught by low i/d teachers was 18.68. This difference of 5.15 points in the adjustment score in favour of the directive or domi-native teachers was found to be significant at .01 level. This

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TABLE 3  
2x2 CONTINGENCY TABLE TESTING THE ASSOCIATION  
BETWEEN 1/d RATIOS OF TEACHERS AND ADJUST-  
MENT/MALADJUSTMENT OF STUDENTS IN FIVE  
AREAS OF PAAS

	Number of students taught by			Significance of chi-square
	High 1/d teachers	Low 1/d teachers	Total	
No. of Students adjusted to home (‘+’ scores)	237	271	508	not significant
No. of students maladjusted to Home (‘-’ scores)	11	12	23	
Total	248	283	531	
No. of students ad- justed to school (‘+’ scores) (65 %)	144	196	340	.05 level
No of students mal- adjusted to school (‘-’ scores), (35%)	78	70	148	
Total	222	266	488	
No. of students ad- justed to teacher (‘+’ scores)	168 (74%)	233 (88 %)	401	.01 level
No. of students mal- adjusted to teacher (‘-’ scores)	58 (26%)	31 (12%)	89	
Total	226	264	490	
No. of students ad- justed to Peers (‘+’ scores)	192	228	420	not signif
No. of students mal- adjusted to Peers (‘-’ scores)	46	49	95	
Total	238	277	515	
No. of students ad- justed in general (‘+’ scores)	213	269	482	not signif.
No. of students ad- justed in general (‘-’ scores)	20	14	34	
Total	233	283	516	

No. of students adjusted ('+' scores)	224 (90%)	271 (95%)	495
No of students mal-adjusted ('-' scores)	25 (10%)	15 (5 %)	40
Total	249	286	535

·05 level

invalidates the hypothesis set up in this study earlier stating that teachers with high i/d ratios will produce better adjusted students than the teachers with low i/d ratios.

To test these relationships further and see the areas in which these negative trends are marked chi-square were calculated between students of high i/d teachers and low i/d teachers on different areas of adjustment. To get more insight into the problem itemwise percentages of students belonging to the two categories of teacher answering each item were also calculated for all the items on PAAS. The chi-squares are presented in Table 3, and the itemwise percentages in Table 4. Table 3 confirms the above observed relationship of dominative teachers having students who are well adjusted. This relationship is markedly evident in the areas of adjustment towards the teacher and the school. About 9% more of the students of low i/d teachers were well adjusted to school and about 9% more of the students of high i/d teachers were maladjusted towards school. This raises to about 14% difference in the adjustment towards the teacher.

TABLE 4  
ITEM-WISE PERCENTAGES OF STUDENTS TAUGHT BY  
HIGH i/d AND LOW i/d TEACHERS CHECKING  
EACH ITEM ON PAAS

Item No.	Scale percentage of students checking the value item and belonging to classrooms taught by	High i/d teachers	Low i/d teachers	Significance of 't' ratio between percentages
Teachers 5	+3	82.2	83.9	not signif.
12	+2	86.5	81.8	"
8	+1	68.3	67.5	"
9	0	80.3	87.0	·05 level
39	-1	44.8	23.3	01 level
40	-2	51.3	46.9	not signif.
25	-3	23.9	15.7	·02 level
27	-4	17.4	9.2	·01 level

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School	22	+3	92.3	95.2	not sig.
	23	+2	77.2	80.1	"
	25	+1	44.8	46.9	"
	24	0	40.0	38.7	.02 level
	10	-1	49.0	33.9	.01 level
	11	-2	34.4	22.6	"
	28	-3	30.1	23.6	not signif.
	2	-4	42.5	39.4	"
Peers	17	+3	90.3	92.8	not sig.
	38	+2	76.1	75.7	"
	36	+1	91.5	91.4	"
	20	0	83.0	84.6	"
	6	-1	53.7	58.2	"
	7	-2	27.8	33.9	"
	18	-3	22.4	15.7	.05 level
	21	-4	22.4	17.5	not sig.
Home	30	+4	93.1	95.9	not sig.
	14	+3	90.7	93.1	"
	13	+2	84.2	91.1	.02 level
	4	+1	52.1	57.9	not sig.
	31	0	73.7	75.3	"
	3	-1	40.9	28.8	.01 level
	15	-2	20.5	18.1	not sig.
	32	-3	37.8	25.7	.01 level
	1	-4	6.6	10.6	not sig.
General	33	+3	90.7	94.2	not sig.
	34	+2	79.5	84.9	"
	29	+1	83.8	89.0	"
	35	0	69.1	72.9	"
	37	-1	32.4	25.0	.05 level
	19	-2	17.0	9.9	.02 level
	16	-3	48.3	28.4	.01 level

Table 4 shows that about 7% more of students belonging to low i/d classes felt that their teachers take lot of work from them in the school (item 9). This may be because the dominative teachers extract lot of work from the students. A very high percentage of students taught by high i/d teachers mentioned that they remember everything at home and forget in the teacher's presence (item 39). And a number of them also said that their teachers do not make them understand anything properly and will be happy if they are transferred (items 26, 27). More number of students belonging to high i/d classes said that they have got sufficient freedom in the class (item 24). This strengthens the validity of i/d ratios as this is in the logically expected direction. The freedom is there in the class but most of them hesitate to speak in the class before others (item 10) and also most of them feel inferior in the class (item 16) as compared to students of

low i/d teachers Responses in a few more items are in favour of students of low i/d teachers. It is not known to what extent all these maladjustments could be attributable to the teacher.

Coming to the question of why this trend, the following may be the reasons as the available data suggests.

1 As mentioned earlier 5 of the teachers from the I/D group have been reclassified into the i/d group in the opposite direction due to their dominance in categories 4 and 5 where as only two teachers who had high I/D ratios were classified into high i/d group as they also had the highest i/d scores. This suggests that the relationship between I/D and i/d ratios is not simple and linear so as to expect the same relationships in both cases.

2 The differences between I/D and i/d is only that of the elimination of questioning and lecturing areas from the latter which has changed the indirect/direct influence pattern to a great extent. The positive relationship observed earlier with I/D ratios and the negative relationship observed now with i/d ratios therefore suggests that students showed better adjustment to those teachers who question more than lecturing. This is true because by questioning the teacher is providing an opportunity for the student to be active in the class for a while. This is highly needful-filling to the pre-adolescents of this age as they have a high attention getting need at their age. This is the reason perhaps why they tend to be more satisfied with the teachers whose question/lecture ratios are high and hence are adjusted to them and there by like the school also By this reasoning we can also expect the students of teachers, who give more opportunity for students to talk, to be better adjusted than of those who do not give such opportunity due to the attention getting need-fulfilment of these students. As will be seen later, this relationship was found to be true with T/S ratios and students adjustment.

3. Thirdly, the observations made only suggest that the teacher who use categories 1, 2 and 3 more than categories 6 and 7 are likely to have students who have negative attitudes or adjustments towards them and the school. As it was seen in Chapter 2; only in rare cases the teachers used category 1 which is highly integrative behaviour category with feeling component in it. Otherwise tendency for the teachers was to use categories 2 and 3, i.e. praising, encouraging and accepting the ideas of students. An examination of the manner in which these categories occur in the Vth grade classes reveals that when the teachers use these categories they use it in a highly routinized way which may not be as effective as the punishing categories of commanding and criticizing.

4. And lastly, perhaps it is too much to expect the pre-adolescents of our culture to be independent enough to grow without much of

directions from the elders. The colonial influence on our culture has not vanished. Though we are striving for democratic values to be internalized what has been internalized over hundreds of years in the form of power and authority may not allow us to change so quickly. Studies conducted with a few adult groups in India have shown that authoritarian styles produced more fruitful results than the democratic styles, as democratic styles of behaviour were found to leave too much of freedom and spoil the climate.\*

With these observations, the hypothesis set up earlier with regard to the relationship between i/d ratios of teachers and students adjustment can be rejected in favour of the reverse relationship.

*Amount of teacher/student-talk and student adjustment.* Similar analysis done for I/D and i/d ratios was carried out to test the relationship between T/S ratios of the classes and adjustment of the students. The mean adjustment score of the classes with high T/S ratios obtained was 15.74 and that for classes with low T/S ratios it was 16.12. The difference is negligible and the 't' ratio calculated was not significant.

Chi-squares were calculated to test the association between T/S ratios and area-wise adjustment and maladjustment.  $2 \times 2$  tables were used with high and low T/S ratios on one side and number of students with '+' and '-' scores on the other side. Chi-square was significant only for the total adjustment score and the  $2 \times 2$  table between the total adjustment scores and T/S ratios is given in Table 5.

TABLE 5  
2x2 CONTINGENCY TABLE TESTING THE ASSOCIATION  
BETWEEN T/S RATIOS AND TOTAL ADJUSTMENT  
SCORES OF STUDENTS

	No. of Students that belong to classes		Total	Chi-square
	with high T/S ratio	with low T/S ratio		
No. of students Adjusted ( '+' scores)	252 (90%)	270 (95%)	522	.05 level
No. of students maladjusted ( '-' scores)	29 (10%)	13 (5%)	42	
Total	281	283	564	

\*From the discussion with Prof. Pandey of I. I. T., New Delhi, and Dr. Thyagarajan of MITRA, Madurai.

Table 5 reveals that more number of students belonging to classrooms where teachers talk less and students talk more were adjusted and less

TABLE 6  
PERCENTAGES OF STUDENTS BELONGING TO HIGH T/S AND  
LOW T/S RATIO CLASSES CHECKING EACH ITEM ON  
PAAS

Item No.	Scale Value	Percentage of students checking the item and belong to classrooms having		Significance of 't' ratio between percentage difference	
		High T/S ratio	Low T/S ratio		
Teacher	5	+3	84.2	95.8	not sign. if.
	12	+2	84.9	84.8	"
	8	+1	69.7	60.6	.02 level
	9	0	38.2	84.5	not significant
	39	-1	38.5	34.3	"
	40	-2	53.3	53.9	"
	26	-3	19.7	17.2	"
	27	-4	21.0	13.1	.01 level
School	22	+3	88.8	93.6	.02 level
	23	+2	82.2	79.8	not significant
	25	+1	57.9	43.1	.01 level
	24	0	47.7	43.4	not significant
	10	-1	40.5	44.8	"
	11	-2	33.9	29.3	"
	28	-3	30.3	22.9	.05 level
	2	-4	39.5	56.9	.01 level
Peers	17	+3	85.8	90.9	.05 level
	38	+2	76.6	72.7	not significant
	36	+1	84.5	92.9	.01 level
	20	0	85.5	88.6	not significant
	6	-1	67.8	62.3	"
	7	-2	37.2	30.0	"
	18	-3	31.2	24.2	"
	21	-4	21.7	20.2	"
Home	30	+4	88.1	94.9	.01 level
	14	+3	87.8	94.9	.01 level
	18	+2	85.5	89.6	not signif.
	4	+1	68.7	47.1	.01 level
	31	0	77.6	77.8	not signif.
	3	-1	41.4	34.3	"
	15	-2	15.5	22.9	.05 level
	32	-3	37.8	30.6	not signif.
1	-4	7.6	16.5	.01 level	
General	33	+3	85.5	96.0	.01 level
	34	+2	78.6	85.5	.05 level
	29	+1	84.9	87.2	not signif.
	35	0	71.4	74.7	"
	37	-1	37.5	27.9	.02 level
	19	-2	18.1	14.1	not signif.
	16	-3	42.4	45.8	"

number of them maladjusted than the students belonging to classrooms where mostly teachers talk.

To go deeper into the association between teacher/student talk ratios and student adjustment, itemwise percentages of students checking each item on PAAS for the two categories of T/S ratio classrooms were calculated. The same are presented in Table 6

Table 6 reveals that the percentage of students, who felt that the teacher takes lot of work from them, are more in classes where teacher talks most (Item 8). In these classes more number of students also stated that they will be happy if their teacher is transferred (Item 27). As explained earlier, by talking more the teacher is depriving the pre-adolescents from the activity need satisfaction. While this was the trend of adjustment towards the teacher, the trend was slightly reversed on the area of adjustment towards school. More number of students belonging to classes of low T/S ratios seem to have felt that the school is a burden for them (Item 2). The observation that the 't' ratios between the mean class-adjustment scores of the two categories of teachers was not significant is perhaps due to the influence of these types of items on the total scores of the students. In the rest also some of the items were in favour of students of high T/S classes.

From the table the general trend again seems to be that more number of students coming from low T/S classes, specially in the area of adjustment towards peers. Many of them also said that they like to study much (Item 33) and do not like to quarrel with others (Item 34). This may be because sufficient opportunity is being provided to them by their teachers to express their feelings which makes them serious and less quarrelsome.

### *Teacher Behaviour and Student Intelligence*

*I/D ratios and intelligence.* To test the hypothesis that teachers with high I/D ratios tend to have comparatively more intelligent students than the teachers with low I/D ratios, the mean intelligence scores of the classes taught by 12 teachers with highest I/D ratios and 12 teachers with the lowest O/D ratios were calculated. Then mean score of each class formed the intelligence index of that class. Mean of the intelligence indices of classes taught by the two categories of teachers, and 't' ratio to test the significance of the difference between means were calculated. The mean intelligence index of the classes taught by high I/D teachers was found to be 26.09, as against the mean intelligence index of the classes taught by low I/D teachers which was 24.17. The difference of 1.92 points between the two categories of teachers was not significant at



05 level. This reveals that there is a *tendency* in the results to support the hypothesis that teachers with high I/D ratios tend to have comparatively more intelligent students. However, further confirmation is needed as the differences were not significant.

Chi-squares were calculated further to see if the high I/D teachers also tend to have more number of students who score above the theoretical median of the intelligence test, i.e. the score of 30. The  $2 \times 2$  contingency tables were made with students of high I/D and low I/D teachers on one side and students getting scores above 30 and below 30 on the other side.

From Table 7 it is evident that about 8% more of the students taught by high I/D ratios had scores above 30 (i.e. above a percentile score of 62). This supports the hypothesis that high I/D teachers tend to produce more intelligent students both qualitatively and quantitatively.

TABLE 7  
2×2 CONTINGENCY TABLE TESTING THE ASSOCIATION  
BETWEEN STUDENT INTELLIGENCE AND INDIRECT/  
DIRECT INFLUENCE BEHAVIOUR OF TEACHERS

	<i>No. of students taught by</i>		<i>Total</i>	<i>Chi-square</i>
	<i>High I/D Teachers</i>	<i>Low I/D Teachers</i>		
No. of students with scores above 30	83 (32%)	67 (24%)	150	
No. of students with scores below 30	178 (68%)	211 (76%)	389	3.97 (significant at 05 level)
<i>Total</i>	261	278	539	

*The i/d ratios and student intelligence.* The mean of class intelligence index of the classes taught by high i/d teachers was found to be 26.52 and that of the classes taught by low i/d teachers to be 29.57. This difference of 3.05 points in favour of students taught by dominative type of teachers was not found to be significant. However, the difference is considerable and suggests a trend in favour of the low i/d teachers (similar to that observed with regard to adjustment and i/d ratios).

Chi-square with  $2 \times 2$  contingency table was calculated between i/d ratios and number of students getting scores above and below 30 on the test. Table 8 gives the same.

As can be seen from Table 8 the chi-square is highly significant in support of the students taught by low i/d teachers. In other words, teachers who used more number of authoritarian acts like directing, commanding

and criticizing showed a tendency to have more number of intelligent students in their classes than the teachers who use praise, encouragement and acceptance of ideas. Hence the hypothesis set up in support of the high i/d teachers is rejected in favour of low i/d teachers.

TABLE 8  
2×2 CONTINGENCY TABLE TESTING THE SIGNIFICANCE OF  
ASSOCIATION BETWEEN I/D RATIOS OF TEACHERS AND  
INTELLIGENCE SCORES OF STUDENTS

	<i>No. of students belonging to the classes taught by</i>		<i>Total</i>	<i>Chi-square</i>
	<i>High i/d teachers</i>	<i>Low i/d teachers</i>		
No. of students with intelligence scores above 30	116 (46%)	184 (63%)	299	13.09 (Significant at .01 level)
No. of students with intelligence scores below 30	132 (54%)	107 (37%)	239	
<i>Total</i>	<i>247</i>	<i>291</i>	<i>538</i>	

*T/S ratios and student intelligence.* The mean of the class indices for classrooms having high T/S ratio and low T/S ratios was found to be 26.85 and 26.98 respectively. The difference is negligible and the 't' ratio was not significant. While the differences were not significant when the class averages were considered, there seem to be an association between the number of students getting high intelligence scores and classroom T/S ratios as revealed by the significant chi-square between T/S ratios and number of students scoring 30 given in Table 9.

TABLE 9  
2×2 CONTINGENCY TABLE TO TEST THE ASSOCIATION  
BETWEEN T/S RATIOS OF THE CLASSROOMS AND NUMBER  
OF STUDENTS SCORING ABOVE 30 IN THE INTELLIGENCE TEST

	<i>No. of students belonging to</i>		<i>Total</i>	<i>Chi-square</i>
	<i>High T/S ratio classes</i>	<i>Low T/S ratio classes</i>		
No. of students scoring above 30 on intelligence test	92 (32%)	138 (48%)	230	15.00
No. of students scoring below 30 on intelligence test	107 (38%)	152 (52%)	259	significant at .01 level
<i>Total</i>	<i>200</i>	<i>290</i>	<i>490</i>	

As can be seen in Table 9 about 16% more of the students, belonging to low T/S ratio classrooms have intelligence scores above 30. This supports the hypothesis that in classrooms where students are given an opportunity to talk more number of students tend to have high intelligence score.

To summarize, students with high intelligence can be found in high I/D, low i/d and low T/S ratio classrooms more in number than in classrooms of low I/D, high i/d and high T/S ratios.

### *Teacher Behaviour and Dependence Patterns of Students*

*I/D ratios and dependency in students.* The mean of class average indices on dependency variable of classes taught by teachers having the highest I/D ( $n=12$ ) and lowest I/D ratios ( $n=12$ ) were 9.85 and 9.90 respectively. The difference is negligible and 't' ratio was not significant, suggesting that the students taught by indirect influence type of teachers did not differ on the dependency trait from the students taught by directive influence type of teachers.

$2 \times 2$  contingency table was prepared to see if the number of students getting scores above 10 (10 being the cutting point between dependence and independence) on PADS (representing dependence) were more in classrooms of low I/D teachers than in high I/D teacher classes as hypothesised. The cell frequencies of each of the 4 cells was same (87) denoting that the number of dependent (or independent) students were same in both the high I/D and low I/D classes.

The dependency scores obtained from PADS cover the dependency of the students on different issues and with different people. The findings that are reported above do not tell us anything about whether the dominative teachers will tend to have students who are more dependent and complying to them than the students of integrative teachers. To test whether the dependency responses of students of high I/D and low I/D teachers differ atleast on a few relevant items, the item-wise percentages of responses were calculated. The same are presented in Table 10.

Table 10 reveals two significant but diagonally opposite trends if we treat dependency and independence as two different dimensions. Table 10 reveals that students taught by indirect influence teachers had more number of students giving dependent responses than the students taught by direct influence type of teachers. This is consistent in all the 5 dependence items of Table 10 (1, 2, 4, 8, 10). In the items that deal with independence (3, 5, 6, 7, 9) it appears that more number of students taught by direct type of teachers gave responses of independence rather than those

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TABLE 10

PERCENTAGES OF STUDENTS BELONGING TO HIGH AND LOW I/D TEACHER CLASSES GIVING DIFFERENT RESPONSES TO EACH ITEM ON PADS

Item No	Item Content	Percentage of students checking 'always' or 'mostly'		Percentage of students checking 'rarely' 'Never'	
		High I/D classes	Low I/D classes	High I/D classes	Low I/D classes
1.	Blindly follow everything teacher tells me	75.3	81.0	12.6**	5.4
2.	Can't do anything without permission of parents	60.1	68.8**	23.8	17.7
3.	Got full self-confidence	79.2**	70.0	10.4	13.1
4.	Parents take care of things for me	76.9	83.2	9.1	5.3
5.	Do everything without dictation from others	66.1	75.7*	15.6	14.3
6.	Do whatever I like	62.6	66.7	16.0	20.5
7.	Face alone when there is a quarrel	45.5	62.4**	26.1*	17.6
8.	Easily persuaded by others	35.6	48.3**	42.6**	20.8
9.	Don't accept anything blindly	38.8	51.8*	42.00**	31.2
10.	Not possible to do anything independently	47.4	61.3**	24.7	22.5

\*Difference with the percentage of students giving the same response in the I/D ratio category is significant at .05 level (\*\* at .01 level).

taught by indirect influence teachers. This trend is significant in 3 items and in one item it is in favour of students taught by indirect influence teachers.

With this apparently contradictory evidence available, it may be premature to conclude anything from the available data except to note the trend in support of the hypothesis.

*i/d ratios and dependency in students.* The mean on class average indices on dependency variable of classes taught by teachers having high i/d ratios (12) and low i/d ratios (12) were found to be 9.94 and 10.16, respectively. The difference is negligible and 't' ratios was not significant suggesting that dependence level was the same in the students of classes taught by integrative as well as dominative teachers.

Chi-square was calculated from the  $2 \times 2$  contingency table to test the association between the number of dependent students (scoring above 10 and below 10) and the high/low i/d ratios of their classrooms. The chi-square was not significant, suggesting that there was no association between

integrative/dominative behaviours of teachers and number of students getting high dependency scores. Flanders (1960) found that dominative teachers produced students who were dependent. While this is so in the U.S.A., it doesn't seem to be true with Indian students. The hypothesis set up earlier between i/d ratios and student dependence can be rejected in favour of null hypothesis. Item-wise percentages of students giving each type of response was calculated separately for students taught by teachers of high i/d ratios and low i/d ratios. No significant trends were observed and data tends to support the null hypothesis that teachers with high i/d ratios had about the same number of highly dependent students as the teachers with low i/d ratios

*T/S ratios and student dependency.* The mean class dependency indices calculated for 12 high T/S ratio classrooms and 12 low T/S ratio classrooms were 10.21 and 10.13 respectively. The difference is negligible and 't' ratio was not significant suggesting that students of high T/S ratio classrooms have about the same average dependency scores of low T/S ratio classrooms. This is further supported by the insignificant chi-square obtained, when  $2 \times 2$  contingency table was prepared to test the association between high and low T/S ratios and the number of dependent/independent students in these classrooms

Item-wise percentages calculated on responses to each of the items separately for students belonging to high T/S ratio classrooms and low T/S ratio classrooms did not reveal any significant trends. From all these observations, the hypothesis that classrooms with high T/S ratios will have more dependent students than the classrooms with low T/S ratios can be rejected in favour of null hypothesis.

### *Initiative and Teacher Behaviour*

*I/D ratios and student initiative levels.* To test the hypothesis that teachers using high indirect/direct influence ratios tend to have students with high initiative levels than the teachers using low indirect influence, average scores of class initiative indices for 12 classes having the highest I/D ratio teachers and 12 classes having the lowest I/D-ratio teachers were calculated. The mean of the class initiative indices of classes taught by high I/D teacher was 10.18 and for the classes taught by low I/D teacher it was 9.38. This .80 difference in the initiative levels of classes taught by high I/D teachers and low I/D teachers is in favour of high I/D teachers and it is not significant as the 't' ratio for the difference in means was not significant.

To test whether the high I/D teacher classrooms tend to have more number of students taking high initiative (i.e., getting scores above 9 and

9 is the theoretical median) chi-square was computed with students taught by high I/D and low I/D teachers on one side and students having scores of 10 or above and student with scores of 9 or below on the other side. The  $2 \times 2$  contingency table, the chi-square of which was significant, is presented in Table 11.

TABLE 11  
2x2 CONTINGENCY TABLE TESTING THE ASSOCIATION BETWEEN  
I/D RATIOS OF TEACHERS' AND STUDENTS' INITIATIVE

	No of students taught by		Total	Chi-square
	High I/D teachers	Low I/D teachers		
No. of students with initiative scores 10 or above	148 (71%)	167 (60%)	315	
No. of students with initiative scores 9 or below	60 (29%)	113 (40%)	173	6.91 significant at .01 level

Table 11 reveals that students taught by teachers who showed more of indirect type of influence showed a tendency to give high initiative taking responses than the students taught by direct type of teachers. This supports the trend observed earlier in the class initiative indices though it was not significant. The significant chi-square is in support of the hypothesis that high I/D teachers tend to have more number of high initiative taking students as compared to low I/D teachers and the hypothesis may be retained valid. The same is further supported by the consistency with which more number of students taught by high I/D teachers gave high initiative responses when item-wise percentages of students giving responses of different initiative levels was calculated for the 6 items of PAIQ. Table 12 reveals that the number of students giving high initiative responses were more in the classes taught of low I/D teachers (Item 1 seems to be the only exception). This gives further support for the hypothesis set up in favour of high I/D teachers.

*The i/d ratio and student initiative.* The means of the class initiative indices of classes taught by high i/d teachers and low i/d teachers were calculated taking the students of 12 teachers with highest i/d ratios, and students of 12 teachers with lowest i/d ratios. The means of class initiative indices taught by high i/d and low i/d teachers were 10.45 and 9.86 respectively. This difference of .59 points in favour of the students taught by high i/d ratios is not significant as the 't' ratio for the difference between the two means was not significant at .05 level of acceptance.

TABLE 12  
PERCENTAGE OF STUDENTS OF HIGH AND LOW I/D RATIO  
TEACHER CLASSROOMS GIVING RESPONSES OF DIFFERENT  
INITIATIVE LEVELS TO THE ITEMS ON PAIQ

Item No	Percentage of students giving responses reflecting							
	Initiative and taught by		Low initiative and taught by		Moderate initiative and taught by		High initiative	
	High I/D ratio	Low I/D ratio	High I/D ratio	Low I/D ratio	High I/D ratio	Low I/D ratio	High I/D ratio	Low I/D ratio
	teachers	teachers	teachers	teachers	teachers	teachers	teachers	teachers
1.	36.1**	26.3	14.5	12.3	7.8	19.1**	41.5	42.2
2.	26.3	28.2	20.6	15.6	1.7	3.6	51.3	52.7
3.	17.2	21.6	27.9	40.3**	8.7**	1.1	46.1*	37.0
4.	17.6	30.6**	3.4	6.1	1.7	0.7	77.3**	62.7
5.	26.4	37.2**	18.3	31.0**	1.0	2.9	54.2**	28.8
6.	26.8	45.4**	19.5	24.3	11.7	9.6	41.9**	20.7

\*+ ratio for the difference between the two percentages of students (students of high I/D classes and low I/D classes) giving the response is significant at .05 level.

\*\* .01 level

Chi-square was calculated between the high i/d, low i/d classes and students with high initiative and low initiative responses to test whether the students taught by high i/d teachers have given high initiative responses than the students taught by low i/d teachers. The percentage of students giving high initiative responses was about 2% more among those taught by high i/d teachers than among those taught by low i/d teachers and the chi-square was not significant at .05 level suggesting that this percentage difference may be due to chance.

Percentage of students giving responses of different initiative levels were calculated for each of the items on PAIQ separately for high i/d classes and low i/d classes. The same are given in Table 13.

Table 13 reveals that in all the items (significantly on 4 items) more number of students taught by low i/d teachers give responses that indicate 'no initiative' than the students of i/d teachers. However, this is compensated to some extent by the significantly less percentage of students of low i/d teachers giving low initiative responses on 3 items (3, 5 and 6) and significantly high percentage of them giving high initiative responses on one item (No. 5).

However, the overall picture is in favour of the students taught by high i/d teachers

*T/S ratios and student initiative.* The means of the class initiative indicates of the classes with high T/S and low T/S ratios were found to be 10.44 and 10.09 respectively. The difference between the two is not significant.

TABLE 13  
PERCENTAGE OF STUDENTS OF HIGH i/d AND LOW i/d  
TEACHERS GIVING RESPONSES OF DIFFERENT  
INITIATIVE LEVELS ON PAIQ

Item No.	Percentage of students giving responses reflecting							
	initiative and taught by		Low initiative and taught by		Moderate initiative and taught by		High initiative and taught by	
	High i/d teachers	Low i/d teachers	High i/d teachers	Low i/d teachers	High i/d teachers	Low i/d teachers	High i/d teachers	Low i/d teachers
1.	28.0	35.5*	18.3	16.4	16.0	16.8	37.7	31.3
2.	22.3	35.5**	10.0	16.1*	1.5	4.2	66.2**	44.2
3.	15.5	22.3*	38.3**	26.4	1.8	2.3	44.2	49.0
4.	21.4	21.6	3.7	3.9	1.8	1.3	73.1	73.2
5.	27.9	30.3	29.4**	19.0	2.3	1.6	40.4	49.0*
6.	25.5	39.5**	28.9*	22.0	16.7**	10.0	28.9	28.5

\*\*Difference between the percentages of students of high i/d and low i/d teachers giving the response is significant at .01 level (\* .5 level).

The chi-square calculated between these two types of classes and the number of students having high/low initiative scores was also not significant indicating that students of high T/S classes and low T/S classes did not differ in their initiative taking responses.

However, the item-wise split of the responses of these students revealed a few significant trend in favour of the classrooms where T/S ratio were low as can be expected. The percentage of students of classes with high and low T/S ratio giving responses of different initiative levels are given in Table 14.

TABLE 14  
PERCENTAGE OF STUDENTS BELONGING TO CLASSROOMS  
OF HIGH T/S AND LOW T/S RATIOS GIVING RES-  
PONSES INDICATING DIFFERENT INITIA-  
TIVE LEVELS ON PAIQ

Item No.	Percentage of students giving responses indicating							
	No initiative		Low initiative		Some initiative		High initiative	
	High T/S classes	Low T/S classes	High T/S classes	Low T/S classes	High T/S classes	Low T/S classes	High T/S classes	Low T/S classes
1.	25.5	32.8	12.5	13.8	24.3**	12.4	37.7	41.0
2.	25.8	30.3	8.4	25.5**	4.6	3.1	61.2**	41.0
3.	20.8	17.2	34.8*	27.2	1.2	6.9	43.3	48.6
4.	25.8**	13.4	5.9	3.4	0.9	1.0	67.4	82.1**
5.	31.0*	23.7	33.5**	23.0	2.2	0.3	33.2	52.9**
6.	38.2**	25.1	29.7*	22.3	9.5	10.3	22.5	42.3**



Table 14 reveals that except in two items, the percentage of students giving high initiative responses were significantly more in the low T/S ratio classrooms than in the high T/S ratio classrooms. Similarly, the number of students giving responses indicating no initiative or low initiative were more in high T/S ratio classrooms than in the low T/S ratio classrooms. This indicates a trend in favour of the hypothesis that students belonging to classrooms with low T/S ratios, tend to be more initiative taking than those belonging to high T/S ratio classrooms was observed. However, with the available data, definite conclusions cannot be drawn.

### *Class Trust and Teacher Behaviour*

*I/D ratio and student trust behaviour.* The mean of the class trust indices of the classes taught by high I/D and low I/D teachers was found to be 21.91 and 21.89 respectively. The difference is negligible and could be attributable to chance. This suggests that students of classes taught by the indirect influence teachers had about the same level of trust as those taught by directive type of teachers. This null hypothesis is further supported by the significant chi-square between students of high and low I/D ratio teachers and the class-trust scores. The  $2 \times 2$  contingency table revealed that about the same number of students taught by high I/D teachers had high level of trust (scores above 20) as those taught by low I/D teachers.

Item-wise analysis of the responses also did not reveal any significant trend of differences between students taught by teachers with high I/D ratios. The hypothesis that indirect influence teachers tend to have students with high class-trust than those of the direct influence teachers has been rejected in favour of null hypothesis on the basis of these observations.

*The i/d ratios and student trust.* Trends similar to those observed above were also observed with i/d ratios. The means of the class trust indices of classes taught by high i/d ( $n=12$ ) and low i/d teachers ( $n=12$ ) were found to be 22.03 and 22.52 respectively. The mean difference of .49 points on trust score between the two categories of classes is not significant as the 't' ratio was not significant at .05 level.

The chi-square calculated between the students of those two categories of teachers and class trust scores as well as percentage differences in item-wise responses of these students were not significant. This shows that null hypothesis is true, and students of high i/d ratio teachers have an average about the same level of trust as the students of low i/d teachers.

*T/S ratios and student trust.* Similar statistics calculated between classes having highest and lowest T/S ratios ( $n=12$  each) and student trust

scores did not reveal any significant differences. The 't' ratio for differences between mean class trust indices of the two types of classes as well as the chi-squares between the two types of classes and class trust scores were not significant. Item-wise percentages of students giving different types of responses also did not reveal any significant trends.

With these observations the hypothesis that students belonging to low T/S ratio classrooms have high class trust than the students of high T/S ratios is rejected in favour of null hypothesis.

### *Activity Level and Teacher Behaviour*

The activity level score of each class was calculated by finding out the average of the activity level scores of the students in each class. It was hypothesised that teachers who show more of indirect type of influence tend to have more students who are active in the class than the teachers who use directive influence patterns. This was not found to be so as the activity level scores of different classes (both high I/D and low I/D classes, high i/d and low i/d classes as well as high T/S and low T/S ratio classes) had very similar (nearly the same) activity level scores. Hence the hypothesis has been rejected in favour of null hypothesis. The major limitation of this test is that the activity level scores of different classes are based on different subjective criteria since each class was evaluated by a different teacher who made forced choice rating. If a standard criteria for the assessment could be used the relationship may perhaps be altogether different.

### *Influence of Classroom Behaviour of Teacher on Student Classroom-Structure*

*Teacher behaviour and cohesiveness* To test if the teacher behaviour has any influence on the structure of the class, the cohesiveness indices of the classes taught by teachers with the highest 10 I/D ratios and the lowest 10 I/D ratios as well as those of the classrooms taught by teachers with highest and lowest 10 i/d ratios were computed. The mean cohesiveness scores of each category of classrooms were calculated, and 't' ratios were computed to test the significance of the difference between means for each of the 3 pairs of classes. The following results were obtained.

1. Mean cohesiveness score of the 10 classes taught by teachers with highest I/D ratios=3.55.

2. Mean cohesiveness score of the 10 classes taught by teachers with the lowest 10 O/D ratios=3.45.
3. The difference between the two means is not significant and hence it can be concluded that classrooms taught by high I/D teachers and low I/D teachers have about the same amount of cohesiveness.
4. Mean cohesiveness score of the 10 classes taught by teachers with highest i/d ratios=4.09.
5. Mean cohesiveness scores of the 10 classes taught by teachers with the lowest i/d ratios=2.93.
6. The difference of 1.16 points in favour of high i/d teacher classrooms is not significant (as 't' ratio was not significant at .05 level) and it may be concluded that high i/d classrooms do not differ significantly from the low i/d classrooms on cohesiveness dimension.

*Teacher behaviour and classroom integration.* The mean classroom integration scores (from sociometry test) were computed for the 10 highest I/D ratios teacher classrooms, 10 lowest I/D ratio teacher classrooms, 10 highest i/d ratio teacher classrooms and the 10 lowest i/d ratio teacher classrooms. Significance of the differences in mean integration scores between the highest I/D and lowest I/D teacher classes as well as between the highest i/d and lowest i/d classes were calculated by 't' ratios. The following results were obtained

1. The mean integration scores of the classes taught by teachers with the highest 10 I/D ratios=25.15.
2. The mean integration score of the classes taught by teachers with the lowest 10 I/D ratios=28.70.
3. The mean difference of 3.55 points on class integration scores in favour of classes taught by low I/D teachers was not found to be significant at .05 level.
4. The mean integration score of the classrooms taught by teachers with the highest 10 i/d ratios=22.10.
5. The mean integration scores of the classrooms taught by teachers with the lowest 10 i/d ratios=33.2.
6. The mean difference of 11.10 points on class integration scores in favour of classes taught by low i/d ratio teachers was significant at .05 level.
7. From this it can be concluded that classrooms taught by directive type of influence teachers tend to have less number of isolates and starts and hence are more integrated than those taught by indirective type teachers (when questioning and lecturing are controlled).

*Teacher Behaviour and Student Reactions to Frustration*

*I/D ratios of teachers and student reactions to frustration* To find out the association between I/D ratios of teachers and student reactions to frustration, chi-squares were computed between high and low I/D ratio classes and the different types and directions of responses to frustration

1. I/D ratios and extrapunitive responses :  $2 \times 2$  contingency table to test the association between the I/D ratios of teachers and the percentage of extrapunitive responses given by the students was prepared and the chi-square computed. Dichotomy in the extrapunitive responses was made on the basis that those who gave more than 60% of extrapunitive responses were classified as high extrapunitives and those giving less than or equal to 60% of extrapunitive responses were classified as low extrapunitives. The chi-square was not significant suggesting that there is no association between the I/D ratios of teachers and percentage of extrapunitive students give in frustrating situations.

2. I/D ratios of teachers and intropunitive responses by students to frustrating situations : The  $2 \times 2$  contingency table was prepared between students taught by high I/D and low I/D teachers and percentage of intropunitive responses given by them on the P-F test. Those giving more than 15% of the intropunitive responses were treated as high intropunitives and those giving 15% or less as less intropunitives. The chi-square between the I/D ratios of the teachers and percentage of intropunitive responses given by students was not significant suggesting that students taught by teachers with high I/D ratios are as much intropunitive as the students taught by teachers with low I/D ratios.

TABLE 15  
 $2 \times 2$  CONTINGENCY TABLE TESTING THE ASSOCIATION BETWEEN  
 I/D RATIOS OF TEACHERS AND PERCENTAGE OF  
 IMPUNITIVE RESPONSES TO FRUSTRATION

	<i>No. of students taught by the 10 highest I/D ratio teachers</i>	<i>No. of students taught by the 10 lowest I/D ratio teachers</i>	<i>Total Chi-square</i>
No. of students giving more than 25% M responses	87 (50%)	68 (37%)	155
No. of students giving 25% or below M responses	89 (50%)	115 (63%)	204 5.5 significant
Total	176	183	359

3. I/D ratios of teachers and impunitive responses by students to frustrating situations :  $2 \times 2$  contingency table was computed as above between

students taught by high and low I/D ratio teachers and percentage of impunitive responses given by them on P-F test. Those giving more than 25% of the responses were treated as high in impunitiveness and those giving 25% or below as low in impunitiveness. Table 15 presents the same.

As revealed by the significant chi-square from Table 15 about 13% more of the students taught by teachers with high I/D ratios gave high percentage of impunitive responses. This suggests that teachers with high I/D ratios gave high percentage of impunitive responses. This suggests that teachers with high I/D ratio tend to have students who are more impunitive.

4. I/D ratios of teachers and need-persistent (N-P) responses of their students to frustrating situations. To test the association between the I/D ratios of teachers and need-persistent reactions of students, giving more than 25% of N.P. responses on P-F test were treated as high need-persistents and those giving 25% or below were treated as low need-persistents. Chi-square was computed to test the associations between the two variables using a  $2 \times 2$  contingency table. The results are given in Table 16.

TABLE 16  
2x2 CONTINGENCY TABLE TESTING THE ASSOCIATION BETWEEN  
I/D RATIOS OF TEACHERS AND NEED-PERSISTENT (N-P)  
REACTIONS OF STUDENTS TO FRUSTRATING SITUATIONS

	No of students of 10 high I/D teachers	No. of students of the 10 low I/D teachers	Total	Chi-square
No. of students giving more than 25% of N-P reactions	80 (48%)	103 (61%)	183	4.98
No. of students giving 25% or less N-P reactions	85 (52%)	87 (39%)	152	significant at .05 level
Total	165	170	335	

Significant chi-square in Table 16 reveals that about 13% more of the students taught by teachers with low I/D ratio gave high need persistent reactions to frustrating situations as compared to the students taught by high I/D ratio teachers. This suggests a trend in favour of low I/D teachers.

5. I/D ratios of teachers and obstacle dominance (O-D) reactions by their students to frustrating situations : Students giving more than 25% of obstacle-dominants and those giving 25% or less of O-D reactions were treated as low obstacle-dominants.  $2 \times 2$  contingency table was prepared

between students taught by teachers with the highest 10 and the lowest 10 I/D ratios and high/low Obstacle-Dominants. Chi-square was not significant since about the same per cent of students taught by high I/D as well as the low I/D teachers gave high O-D responses. This suggests that there may be no association between I/D ratios of teachers and O-D reactions of students to frustrating situations.

6. I/D ratios of teachers and Ego-Defensive (E-D) reactions of their students on P-F study : Students giving more than 50% of E-D responses on P-F test were classified as high ego-defensives and those giving 50% or less of E-D responses as low ego-defensives. Chi-square was computed to test the association between I/D ratios of teachers and the ego-defensive responses of students. The results are given in Table 17.

TABLE 17  
2×2 CONTINGENCY TABLE TESTING THE ASSOCIATION BETWEEN  
I/D RATIOS OF TEACHERS AND EGO-DEFENSIVE REACTIONS  
OF STUDENTS TO FRUSTRATING SITUATIONS

	<i>No. of students of the 10 highest I/D ratio teachers</i>	<i>No. of students of the 10 lowest I/D ratio teachers</i>	<i>Total</i>	<i>Chi-square</i>
No. of students giving above 50% E-D responses	125 (76%)	110 (65%)	235	4.88 signi- ficant at 0.5 level
No. of students giving 50% or less E-D responses	40 (34%)	60 (35%)	100	
Total	165	170	335	

As the significant chi-square in Table 17 reveals about 11% more of the students taught by teachers with high I/D ratios gave high percentage of Ego-Defensive responses than those of low I/D teachers. This suggests that high I/D teachers tend to have students who give more ego-defensive reactions to frustrating situations.

7. I/D ratios of teachers, NP/O-D and NP/E-D ratios of students . Those students having NP/OD ratios above 1.00 were treated as one category and those having 1.00 or below as another. Chi-square was computed between NP/OD ratio categories and I/D ratio categories to test the association between the two. The chi-square was not significant, indicating that students of high I/D ratio teachers give about the same proportion of NP/OD reactions as the students of low I/D teachers.

Similarly, the chi-square between I/D ratios and NP/ED response ratios was not significant statistically suggesting that there is no association between the two variables.

Thus the overall picture so far obtained suggests an association between I/D ratios of teachers and percentage of Impulsive, Need-Persistent and Ego-Defensive reactions given by the students to frustrating situations.

Besides the chi-squares calculated for the variables described so far, class average score on the variables E, e, I, i, m, GQR and number of trends were calculated for each class which formed the score of that class. Mean scores on each of these variables for the classes taught by teachers with the highest 10 I/D ratios and for the classes taught by teachers with the lowest 10 I/D ratios were calculated. 't' ratios to test the significance of the differences between mean scores of classes taught by these two categories of teachers were computed. 't' ratio tests were significant only for the variable 'e' (extrapunitive-need persistence reactions). The results suggested that students taught by low I/D teachers tend to give an average about 9-10% more of 'e' responses than the students taught by high I/D teachers.

*i/d ratios and student reactions to frustration* To find out the relationship between indirect/direct influence patterns of teachers and student reactions to frustration the three types of reactions to frustration, the three directions of responses to frustration, and NP/OD ratios and NP/ED ratios were studied as in the case of I/D ratios. Chi-squares based on  $2 \times 2$  contingency tables were calculated for each of the above reaction patterns to frustration and the students taught by the two categories of teachers.

1. *i/d ratios and expunitive-ness* The  $2 \times 2$  contingency table testing the association between the *i/d* ratios of teachers and percentages of expunitive responses given by their students are given in table 18.

TABLE 18  
2x2 CONTINGENCY TABLE TESTING THE ASSOCIATION  
BETWEEN I/D RATIOS OF TEACHERS AND  
EXTRAPUNITIVE RESPONSES OF STUDENTS  
TO FRUSTRATION

	No. of students of high <i>i/d</i> tea- chers	No. of students of low <i>i/d</i> tea- chers	Total	Chi square
No. of students giving more than 60% of extra- punitive respon- ses	90 (60%)	69 (41%)	159	11.8 significant at 0.1 level
No. of students giving less than 60% of extra- punitive respon- ses	59 (40%)	99 (59%)	158	
Total	149	168	317	

Table 18 reveals that about 19% more of the students taught by high i/d teachers gave high (more than 60%) extrapunitive responses. This may either be due to suppression on the part of the students taught by directive type of teachers and free expression on the part of the students taught by high indirect influence type teachers. It may be concluded that teachers of high i/d ratios tend to have more number of students who show tendencies to blame the environmental object when faced with frustrating situations.

2. i/d ratios and intropunitiveness: As in the case of I/D ratios students giving more than 15% of 'I' responses were taken as high intropunitive group and those giving 15% or below 15% of 'I' responses were taken as low intropunitive group.  $2 \times 2$  contingency table was prepared and chi-square was computed between students of high and low I/D ratio teachers and percentage of intropunitive responses. Table 19 presents the results.

TABLE 19  
2x2 TABLE TO TEST THE ASSOCIATION BETWEEN I/D RATIOS OF  
TEACHERS AND INTROPUNITIVE RESPONSES OF STUDENTS

	<i>No. of students of the 10 high- est i/d teachers</i>	<i>No. of students of the 10 lowest i/d teachers</i>	<i>Total</i>	<i>Chi square</i>
No. of students with high per- centage of I	73 (49%)	53 (31%)	126	10.03 significant at .01 level
No. of students with low per- centage of I	76 (51%)	115 (69%)	191	
Total	149	168	317	

Table 19 reveals that about 18% more of the students taught by teachers with high i/d ratios gave a high percentage of intropunitive responses to frustrating situations.

3 i/d ratios and impunitive responses by students to frustrating situations: Students giving more than 25% of M responses were grouped as high impunitives in frustrating situations and those giving 25% or less of M responses as low impunitives.  $2 \times 2$  contingency table was prepared between high/low i/d ratios and high/low impunitives, and chi-square was computed to test the association between the two. Table 20 presents the values.



TABLE 20

2×2 CONTINGENCY TABLE TO TEST THE ASSOCIATION  
BETWEEN I/D RATIOS OF TEACHERS AND  
IMPUNITIVE REACTIONS IN THEIR  
STUDENTS TO FRUSTRATING  
SITUATIONS

	<i>No. of students of the 10 high i/d teachers</i>	<i>No. of students of the 10 low i/d teachers</i>	<i>Total</i>	<i>Chi-square</i>
No. of students giving more than 25% impunitive responses	51 (34%)	95 (57%)	146	15.83 significant at .01 level
No. of students giving 25% or less impunitive res- ponses	98 (66%)	73 (43%)	171	
Total	149	168	317	

Table 20 reveals that about 23% more of the students taught by low i/d ratio teachers gave a high percentage of impunitive responses as compared to those taught by high i/d teachers. These results so far suggest that teachers with indirective type of influence tend to have more number of students which give low percentage of impunitive responses and a high percentage of intropunitive and extrapunitive responses.

4 i/d ratios and Need-Persistence reactions : Breakdown of N-P responses was made on the 25% criterion as earlier. The chi-square between i/d ratios and Need-Persistent reactions was not significant, as the percentage of students giving high need-persistence reactions to frustration were about the same in the classes taught by teachers with high i/d and low i/d ratios.

5. I/d ratios and obstacle-dominance reactions . The chi-square calculated between i/d ratios and obstacle dominance reactions (more than 25% of C-D treated as high and 25% or less as low) was also not significant at .05 level suggesting that there is no association between i/d ratios of teacher and C-D type reactions of students to frustration.

6. i/d ratios and Ego-Defensive reactions . The chi-square calculated between i/d ratios and ego-defensive reactions (above 50% forming high E-D group and 50% or below forming low E-D group) was not significant suggesting that there is no association between i/d ratios of teachers and percentage of E-D type responses of students.

7. i/d ratios and MP/ED response ratios : The chi-square calculated to test the association between i/d ratios of teachers and MP/OD ratios of student responses, and between i/d ratios and NP/ED ratios of student

responses, were not significant as about the same percentage of students taught by the teachers with the highest 10 i/d ratios gave high MP/OD and high NP/ED reactions compared with those taught by the teachers with low i/d ratios.

8. Other variables : 't' ratios were calculated to test the significance of the difference between the means of the class-scores of the classes taught by the teachers with highest 10 i/d ratios and the classes taught by teachers with lowest 10 i/d ratios, on the other P-F variables E, E, e, I, i, m, GCR and Number of trends. The 't' ratio was significant only in case of m (impunitive-need-persistence). The percentage of 'm' responses given by students in classes taught by low i/d ratios was on average about 3% more than those given by the students of high i/d teachers.

The insignificant differences indicate that though students taught by high i/d and low i/d teachers differ in the directions of their responses to frustration these differences are minimized when type of reactions are also added to directions in most cases. (We don't know that I, M and M, as these were not calculated here).

*T/S ratios of classrooms and student reactions to frustration.* As in the case of I/D and i/d ratios chi-square were calculated between T/S ratios and student reactions to frustration. Ten classrooms where the teacher talked more than the students (high T/S ratio) and another ten classrooms where relatively the students talked more (low T/S ratios) were taken. Chi-squares were calculated by using  $2 \times 2$  contingency tables to test the association between T/S ratios and each of the following variables.

1. Extrapunitive Responses (above 60% one category, and 60% or below another)
2. Intropunitive Responses (above 15% one category, and 15% or below another).
3. Impunitive Responses (above 25% one category, and 25% or below another).
4. Need-Persistent responses (above 25% one category and 25% or below another).
5. Ego-Defensive Responses (above 50% one category, and 50% or below another).
6. Obstacle-Dominant Responses (above 25% one category and 25% or below another).
7. NP/OD ratios, and (1.00 and below one category and above 1.00 another)
8. MP/ED ratios (1.00 and below one category and above 1.00 another).

While none of the chi-squares between T/S ratios and direction of reactions were significant, under type of reactions associations were found

with Ego-defensive type of reactions and with NP/OD ratios. The  $2 \times 2$  contingency tables for these two significant chi-squares are given in Tables 21 and 22.

Table 21 reveals that about 19% of the students belonging to classrooms of low T/S ratios (high student talk) gave a high percentage of ego-defense reactions to frustrating situations. It appears that more the

TABLE 21  
2x2 CONTINGENCY TABLE TO TEST THE ASSOCIATION BETWEEN  
T/S RATIOS AND PERCENTAGE OF EGO-DEFENSIVE REACTIONS  
TO FRUSTRATION

	<i>No. of students of the 10 highest T/S classroom</i>	<i>No. of students of the 10 lowest T/S classes</i>	<i>Total</i>	<i>Chi-square</i>
No of students giving more than 50% E.D reactions	95 (59%)	96 (78%)	191	
No of students giving 50% or less E.D reactions	65 (41%)	27 (27%)	92	11.05 significant at 01 level
Total	160	123	283	

TABLE 22  
2x2 CONTINGENCY TABLE TO TEST THE ASSOCIATION BETWEEN  
T/S RATIOS OF CLASSES AND NP/OD REACTIONS OF  
STUDENTS

	<i>No. of students of the 10 highest T/S classes</i>	<i>No. of students of the 10 lowest T/S classes</i>	<i>Total</i>	<i>Chi-square</i>
No. of students having NP/OD ratios above 1.00	127 (79%)	76 (62%)	203	10.61 significant at 01 level
No. of students having NP/OD ratios at 1.00 or below	33 (21%)	47 (38%)	80	
Total	160	123	283	

freedom given to talk more ego-defensive the person becomes when faced with frustration. However the relationship disappears when E-D reactions are considered in relation to NP reactions as the chi-square with NP/ED was not significant. Table 22 reveals that about 17% more of the students belonging to high T/S ratio classrooms (high teacher talk) gave Need. Persistence reactions that out-number the obstacle dominance reactions. This suggests that students belonging to classrooms where teachers talk more, tend to give more need-persistent than obstacle-dominance reactions

to frustration as compared to students in low teacher-talk classrooms who give more number of ego-defensive reactions to frustration.

No association was found between T/S ratios and the P-F variables E, E, e, I, i, m, GCR and number of trends as the 't' ratios between mean scores of the two categories of classrooms were not significant

*Category-wise Differences in the Schools with High Adjustment and Low Adjustment Scores*

The results presented so far, though suggest a trend in favour of high I/D ratio and low i/d ratio teachers, they do not reveal in any clear-cut way in which verbal interaction behaviour of the teachers is influencing the mental health variables of the students. The apparently contradictory associations shown by the I/D ratios and i/d ratios may have been caused by categories 4 and 5. Secondly these observations raise the question whether the indirect influence assumed to run through categories 1 through 4 is really in direct at all? Similarly can we assume that directive behaviour is the major dimension underlying categories 5, 6 and 7? Even if indirect influences are the dimensions underlying the categories 1 to 4 and 5 to 7 respectively, to what extent each of these categories contribute to their respective dimensions is another question which has not been attempted to be different researches on Flanders'. It is quite likely that a category used by one teacher is not as effective as the same category used by another teacher. Or it may be that a particular teacher shows directive behaviour in verbal interaction and is not really directive in his feelings and perhaps more affectionate?

Another possibility which has been raised already in the question of culture. It is no surprise that studies abroad (*i.e.* in the U.S.A.) have shown better achievement and other characteristics of students taught by high indirect influence teacher because the cultural values and cultural norms there are all continuous promulgators of values of freedom and independence. However, in India these are different. Very few parents in India are democratic enough to leave the 10-year old child entirely on his own. In such an atmosphere the students may have different expectations about the teacher, and completely freedom-giving teachers may not fit into the figures the student has internalized. Another hypothesis may be that the effect of directive or non-directive behaviour of the teacher is highly dependent on the task. It is quite likely that a few activities require high direction from the teacher while a few do not. So the effects of these two opposite types of behaviour may not be universally the same.

It is also likely that a flexible teacher may be more effective inspite of his excessive directive type behaviour or indirective type of behaviour

than a rigid, indirective or directive teacher. A corollary of this may be that those teachers who strike a balance between the two tend to have desirable effects on students than the extremists.

Many such questions can be raised from the results obtained in this study and several hypothesis could be set up some of which need to be answered by studies of altogether different designs. An attempt has been made to answer one of the above questions—"whether the teacher of the highly adjusted and least adjusted classes show significantly different amount of each category on at least a few categories". This question attempts to see the differences on each category rather than indirect/direct ratios alone. To answer this question 7 classes (of the 50) which had the highest mean scores on adjustment and another 7 classes which had the lowest mean scores on adjustment were taken. (These classes also were highest

TABLE 23  
CATEGORY-WISE MEANS OF TEACHER INTERACTIONS,  
COMMON MEDIAN AND SIGNIFICANCE LEVEL OF THE  
MEDIAN TEST BETWEEN 7 HIGHLY ADJUSTED  
AND 7 LEAST ADJUSTED CLASSROOMS

Category	Mean No. of Observations per thousand		Common Median	No. of teachers above the common median		Significance level of median test
	High adjustment classes (n=7)	Low adjustment classes (n=7)		High adj. schools	Low adj. schools	
1.	0.0	0.49	0	0	1	N.S.
2.	3.64	14.74	16.72	3	4	"
3.	7.07	21.50	7.1	3	4	"
4.	92.31	90.84	73.2	4	3	"
5.	373.63	525.47	433.4	2	5	"
6.	33.51	43.64	28.7	2	5	"
7.	8.31	29.14	4.8	4	3	"
8.	275.90	96.87	112.4	4	3	"
9.	83.8	104.43	65.8	4	3	"
10.	122.10	73.54	67.4	3	4	"
I/D	0.545	0.316	0.321	6	1	.05
i/d	0.748	0.783	0.700	2	4	N.S.
T/S	2.08	4.274	2.40	1	6	.05

and lowest with regard to their mean scores on adjustment towards teacher). Median test was done for each category separately to test the null hypothesis that both the groups have the common median. (Median test was chosen in view of the high variance in the category frequencies in

both the groups and the small 'n') Median test was also done between the two groups for ID, i/d and T/S ratios. The means of the two groups, the common median and significance levels of the median test for each category are presented in Table 23. Columns 5 and 6 of the table presents the number of teachers in each group of schools that had observation scores (per thousand) above the common median on each category. The number of teachers below the common median could be obtained by subtracting each number from 7 (as the total number of teachers were 7 in each group).

Table 23 reveals that the median test was not significant at .05 level for any of the categories suggesting that the median number of observation for both the groups of teachers on each category may be about the same. Though the means do point out to certain difference they cannot be taken to be representative as the variance in both the groups was very high. Though not significant at .05 level, categories 5 and 6 show a notable trend as 5 out of the 7 teachers of the schools with lowest mean adjustment scores showed their number in these categories above the common median. The I/D ratio and T/S ratios show that both the groups are independent as 6 of the 7 classes with the highest mean adjustment scores had scores above the common median of I/D ratios and scores below the common median of T/S ratios. These results confirm the earlier observations.

From all these results discussed so far it can only be concluded that there was a tendency in the students of classrooms taught by high I/D ratio teachers to be better in adjustment and a few other mental health variables than the classes taught by low I/D ratio teachers. More student talk and less teacher talk classrooms also tend to have high scores on adjustment and other mental health variables. There was also a trend in favour of low i/d ratio teachers having better students but this may not be attributable to increased use of categories 6 and 7 or decreased use of categories 1, 2 and 3. And the question of what this is due to remains unanswered.

#### SUMMARY AND IMPLICATIONS

An attempt has been made to find out the association between teachers' classroom interaction behaviour as measured by Flanders' technique and a few dimensions of students' mental health. While studying these associations attention was focussed mainly on the I/D ratios, i/d ratios and T/S ratios and only with adjustment scores the category-wise associations were tested in the end. The indirect/direct influence ratios of the

two types revealed two different and opposite associations. More per cent of students who are well adjusted, more intelligent, high initiative-taking highly impulsive, less need-persistent and more ego-defensive in their reactions to frustration were found in classes taught by teachers with high I/D ratios as compared to the students taught by teachers with low I/D ratios. However, a reverse trend was observed when the content controlled i/d ratios were used. More per cent of students well adjusted, more intelligent, less extrapunitive and intropunitive but more impulsive were found in classrooms taught by teachers with low i/d ratios as compared to the students taught by teachers with high i/d ratios.

Associations and differences on the rest of the variables were not statistically significant. Item-wise analysis on the tests supported the observations made above. Classrooms with low T/S ratios were found to have more per cent of well adjusted and more intelligent students and had more students giving less need-persistent but more obstacle-dominant reactions to frustration. Category-wise analysis using median tests between well-adjusted and least adjusted student classes revealed that on all the categories both the groups had about the same medians. However, a trend was shown by the teachers of well adjusted classrooms to use less of lecturing and directing. Classes with high adjustment scores were found to be taught by teachers with high I/D ratios and were having low T/S ratios.

While these results show consistently the desirability of high I/D ratios of teachers and low T/S ratios of the classrooms, they do raise certain doubts about the relative effectiveness the categories 2, 3, 6 and 7 (as 1 is negligibly small) as the low i/d ratios showed different trends. These results raise many questions such as to what extent the categories 1, 2, 3 and 4 contribute to the indirect influence dimension and to what extent the categories 5, 6 and 7 contribute to the direct type of influence assumed by Flanders in his technique ? To what extent classroom verbal behaviour reflects the actual intended behaviour of the teachers ? What is the optimal level of use of indirect *vs* direct interaction behaviour that would be more effective in boosting the mental health level of the student ?, and so on.

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# The Grammar of Artifactual Action

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*This paper begins by defining artifactual action and discriminates between three levels of artifactual action as ideological invention, policy-making and intervention design. There are similarities between these three processes. This paper, however, deals only with the process of intervention design. It is suggested that a grammar of artifactual action is possible without first answering the question whether the design of instrumental artifactual action is an art, a science or even a separate professional discipline.*

*Three elements of the grammar of artifactual action have been separated (1) structuring the situation of action, and the change maker's relationship with the structured situation (that is, defining the boundaries of the configuration of change relationship and the networks of process relationships within the configuration of change) , (2) generating typical expectations about the social entities within the configuration : their objectives, motivations and patterns of mutual interactions (that is generating generalizations about behaviours of actors involved, on the basis of experience or systematic social and behavioural science knowledge); and (3) experiencing and observing the situation to collect valid data in situ for applying existential corrections to the typical expectations about the situation*

*Strategizing for instrumental artifactual action thus involves a dynamic combination of these three related processes. The essence of strategizing is to increase the power of the innovator system in relation to the adopter system if the adopter system is resistant to change, or to enable those in the adopter system to make more satisfying power transactions<sup>1</sup>. Power is seen as an attribute of the individual and may be ex-*

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<sup>1</sup>For an elaboration of these ideas see a companion paper by H. S. Bhola, "Power - The Anchor of Stability, The Lever of Change (Notes Towards a General Theory of Being and Society)," available from the author (Mimeo, July, 1976).

perienced without having to be exercised on another individual or group. Power is shown to have various currencies, ranging from physical violence to affection. Which form of power is brought into play in a particular change situation is asserted to be a question of values of the change maker.

This is the skeleton of what we hope will become a larger monograph on the grammar of artifactual action. In later months we will have opportunities to examine further the usefulness of "grammar" as analogue. We would apply this grammar to artifactual action at the levels of ideological invention and policy-making. Also we would seek to demonstrate the usefulness of this conceptualization in explaining and integrating the various research findings in the areas of innovation, diffusion and planned change and reconcile divergent hypotheses and theoretical assertions.

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A STUDY of the grammar of action must make assumptions about the meaning and the value of action in human life. Paulo Freire<sup>1</sup> puts it thus :

Men as beings of the *praxis*, differ from animals which are beings of pure activity. Animals do not consider the world; they are immersed in it. In contrast, men emerge from the world, objectify it, and in so doing can understand it and transform it.

Freire goes on to assert that *praxis* is the "ontological vocation" of man and for man not to engage in praxis, through a cycle of action and reflection, is to be less than human. The *Bhagavad-Gita*, the most famous and popular of Hindu religious writings enjoins "the necessity of action for all men and even for God."<sup>2</sup> It tells the *Karmayogi* : "The performance of action without regard to its fruit is itself a mode of detachment."<sup>3</sup>

#### *Just Action and the Immorality of Inaction*

Man's innermost life of thoughts and wishes has also been subjected to moral evaluation in many theological and philosophic systems. However, man's actions in regard to other men are of direct concern to a *Karmayogi* as well as to the ordinary change agent. What is moral or just action ? Rawls sets forth two principles of social justice that should be found acceptable in a rational community of human beings interested in social action :

First : each person is to have equal right to the most extensive basic liberty compatible with a similar liberty for others.

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<sup>1</sup>Paulo Freire, *Pedagogy of the Oppressed*, Translated by Myra Ramos, Seabury Press, 1971.

<sup>2</sup>Geoffrey Parrinder, *A Dictionary of Non Christian Religions*, Philadelphia : The Westminster Press, 1971, page 44.

<sup>3</sup>S. G. F. Brandon (Ed.) *Dictionary of Comparative Religions*, New York : Charles Scribner's Sons, 1970, page 136.

Second : social and economic inequalities are to be arranged so that they are both (a) reasonably expected to be to everyone's advantage, and (b) attached to positions and offices open to all.<sup>4</sup>

Rawls restates the second principle as follows

Social and economic inequalities are to be arranged so that they are both (a) to the greatest benefit of the least advantaged, and (b) attached to offices and positions open to all under conditions of fair equality of opportunity.<sup>5</sup>

Rawls's definition of just action becomes explosive when the community of men being considered is not composed merely of those living within one nation state but of the total human race, and when the arrangements being discussed are, therefore, global arrangements. It would be a challenge for men and women all over the world to take such just and moral actions.

While all men can engage in action, all human beings are not fortunate or courageous enough to engage in significant action in the course of their lives. In some unjust and brutal social systems, just action on the part of an individual may result in the removal of that individual from the situation, by imprisonment or by death. In the circumstances, inaction may be forgivable under some conditions. However, inaction may be immoral when actions must be taken but are merely left for others to take, at the risk of their lives. Sometimes half-baked humanism or misguided conservatism may lead us to a position of letting people live their lives so that we do not destroy the integrity of their cultures.

### *Open-ended Collaborations*

Freire, who has been quoted earlier, has suggested a pedagogy for helping the oppressed out of their dependencies, and their culture of silence. He suggests that those who go out to help the underprivileged should not substitute one oppressive reality with another oppressive reality. The oppressed must be helped to engage in dialogic action, enabled to look at the reality that surrounds them and change it themselves, in their own way, to create a new reality that is, again, their own. This is to be achieved through conscientization, a process of generating self-awareness.<sup>6</sup> Others have talked of mutuality between the consultant and client and of authenticity on the part of the change agent<sup>7</sup>; yet

<sup>4</sup> John Rawls, *A Theory of Justice*, Cambridge, Harvard University Press, 1971, page 60.

<sup>5</sup>*Ibid.*, page 83

<sup>6</sup> Paulo Freire, *Op Cit.*

<sup>7</sup>Chris Argyris, *Intervention Theory and Method: A Behavioural Science View*, New York: Addison-Wesley, 1970.

others have proposed collaborative technical assistance to poor nations<sup>8</sup>. These good intentions, however, need to be put in a proper perspective. Immaculate conceptions are part of the theology and mythology both in the East and the West. But in the day-to-day world of actions, immaculate births of events of change have been unknown. It is seen that some are being oppressed. It is seen that their reality is oppressive. It is seen that the oppressed have not been able to help themselves, and that outside intervention is needed. To wit, an outsider has already defined the situation as oppressive and will assist so that this situation of oppression can be changed into a situation of non-oppression. Right there, the imposition of the definitions of the present and of the images of a desirable future has taken place. The situation also has already been diagnosed as needing outside help.

It is not being suggested that the outside change agent should carry with him ready-made solutions which he must impose on communities as good for them, and in their best interest. The change agent must be open-ended, he must be modest; he must learn from the realities surrounding him, and he must make the change experience a learning experience for those for whom the change is intended. As he goes through these processes, he must continuously apply existential corrections to his earlier vision. The vision must become shared, and in the process of sharing must become somewhat or even completely changed. However, there is no room for a change agent who had no ideology, no general sense of direction, no particular commitment but simply came to create conscientization,

### *Definition of Artifactual Action*

Herbert Simon in his writings has characterized organizational design as the science of the artificial. As do Ostom and Hennessey,<sup>9</sup> we prefer the term artifactual in describing purposive, organization and intervention behaviour of man. Artifactual action as used in this paper is social action organized by a conception of means and ends relationships (It does not cover the engineering of material artifacts.) We include in our

<sup>8</sup>See Dennis Goulet, *Crucial Choice*, New York: Atheneum, 1971. The discussion at the Indiana University Conference on Foundations of Institutional Design for Enlarging Public Policy Implementation Capabilities (April 11-12, 1975, Bloomington, Indiana) was full of these collaborative concerns in technical

assistance matters: "internationally,

(W. ... and T. ...), *Institutional Analysis and Design* (W. ... Institutional Analysis), Department of Political Science, Indian University. ... page 11-29.



It will be somewhat presumptuous for this author to write books on the absolute elite—the Lenins, the Gandhis, the Maos and the Castros. They are self-schooled, and they can teach us much through their words and actions. It will be equally presumptuous for the author to offer through this paper a seminar to the authorized elite. However, it is possible to address groups of the instrumental elite, who are numerous and who literally run the lives of the people in all societies all over the world, on the subject of the grammar of artifactual action. In this paper, we will be focussing on *the design of interventions for innovation diffusion and planned change*. This will still cover a large area of artifactual actions; teaching, consulting, advising, advocating, marketing, evangelizing, innovating, campaigning, group counselling, family planning, agricultural extension, health education, curriculum design, organizational design, planning, institution building, technical assistance, technology transfer, development and modernization.

### *Art or Science*

Is intervention design an art? Can it be a science, or separate discipline? To propose a grammar of artifactual action, these questions do *not* have to be answered first. Art after all does have form. We do talk of the grammar of films. Interdisciplinary sciences are not only possible but also have been proven to be robust, and have solved problems which sciences based on pure disciplines were unable to tackle.

Our assumptions are as follows. Intervention design is not a pure discipline; it is an area of interest. It is interdisciplinary. It draws from all the social and the behavioural sciences. Further, one can go scientifically about the problems of intervention design. Intervention design has to do with individuals, groups, institutions, and communities living their normal lives, out in the open world. Intervention designers have to know and understand the peoples, groups and systems they seek to change. This involves understandings, perceptions, and sensibilities; and some intuitions that are not the same as reasoned anticipations. It might be useful, therefore, to speak of "the art of the science of intervention design."

### *Grammar as Analogue*

We use the word grammar here in its conventional meaning of the structure of the elements of an art or science; an elaboration of "the basic elements or principles of a science, art, discipline, practice"<sup>13</sup>. The use of grammar as an analogue, however, might help us develop concepts

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<sup>13</sup>Webster's *Third New International Dictionary*, 1961.

equivalent to morphology, syntax and semantics, and help reproduce the study of structure of languages and dialects, and the study of the structures of prescriptive statements, developed to guide intervention design.

### *Three Elements of Artifactual Action*

Three elements are involved in artifactual actions of our interest :  
1) Ordering/Relating, (2) Expecting/Typifying, (3) Experiencing/Correcting. These may be seen interacting below in Fig. 1.

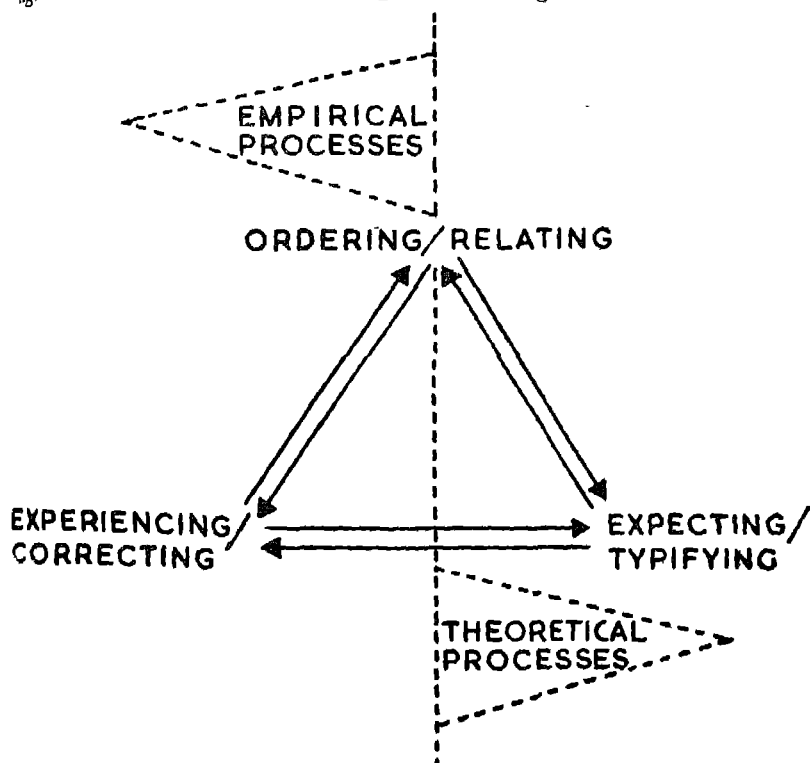


Fig. 1. Three elements of the grammar of artifactual action, their nature and interrelations

### *Ordering/Relating*

The reality surrounding the change agent must be *ordered* in some way for the change agent to be able to do anything with it. A perceptual net must be thrown on the buzzing, booming confusion that the phenomenological world presents and some elements and configurations of that reality must be "caught in the net". To understand is to structure, to structure is to include some, to exclude much else, to draw boundaries, and to reveal bonds between the entities included within the circle of concern.



There may be two types of ordering : (1) Structural ordering, and (2) Time ordering. Structural ordering involves the symbolic reconstruction of a chosen piece of reality in all its multiple dimensions, separating the various overlapping and intersecting subsystems that are part of this reality. Time ordering puts structural relationships on the rails and makes them dynamic. It brings a sense of history to the relationships and continuity to processes under study. It separates antecedents from what follows, helps divide processes into cycles and phases.

The ordering/relating process must also order the change maker into the configuration of change. He must structure himself into the structure of ordered relationships. That is, the change maker must clarify his own relationship with his client system.

### *Expecting/Typifying*

Once the reality surrounding the change agent has been ordered, as well as the change agent's relationships with this ordered reality, the change agent must develop a set of expectations about the *social entities*, and the *processes* that are part of this reality. The world of artifactual action will be peopled with individuals who are organized into various groups and institutions, who are parts of particular occupational, religious, ethnic, and economic class subcultures ; and who are members of particular nation states and cultures. The change maker must have knowledge of the typical behaviour of individuals, groups organizations and cultures to be able to develop some expectations about behavioural acts and episodes that would most likely occur in the change situation of his concern. He must also have developed typical expectations about teaching learning, organizational and distributive processes that may be part of his ordered reality. An advisor from an American university hoping to work in the Indian planning commission, for example, should be able to generate some *typical* expectations about the situation based on his knowledge of India as a culture. His knowledge about the planning process, and of bureaucratic behaviour should help him develop further expectations about what he will find in the planning commission in New Delhi. His understanding of individual motivations should prepare him somewhat for work with his Indian colleagues.

These typical expectations must be built on the basis of collective human wisdom. Sometimes this collective wisdom may be available only as anecdotes and stories. Ideally, it should be available in the form of systematized and tested social and behavioural science knowledge. We will see what social and behavioural sciences have to tell us in this regard.

### *Experiencing/Correcting*

Developing a set of typical expectations about the change situation

is an important part of the task of the change agent but the process provides only blueprints and stereotypes which must be tested, revised, expanded, or altogether discarded. The change situation must be experienced by the change agent existentially, and corrections applied to his initial blueprints for change. Out there in the actual world of change, people are real with real names—Paul, Ali, Maria and Shanti. They are caste, class and sex types, but they are also individuals with histories of socialization that are uniquely their own. They belong to groups and those groups are typical in some ways, but those groups are also situation-specific with their own genesis, purposes and climates. They are working within

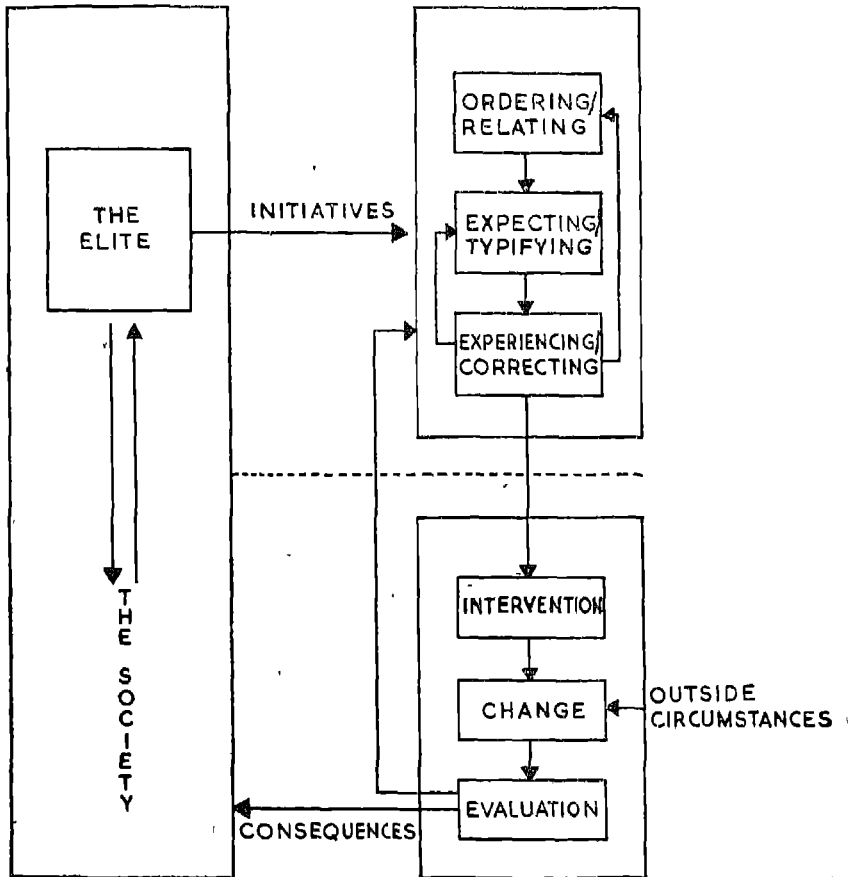


Fig 2 A model of the grammar of artifactual action

organizations, and organizational behaviour, in some ways, is typical across organizations and even across cultures, but these organizations now have particular names, street addresses and existential realities. Again, while typical statements could be made about cultures, a change agent would

come in touch with a particular segment of culture. Model cultural types will get confounded. There would be reformed Jews, westernized Brahmins, Sanskritized non-Brahmins, and Pathans that are pacifists. The grammar of artifactual action prescribes that existential corrections be applied to both of the other two elements of the grammar—to structural and time orderings, and to sets of typical expectations.

On the basis of the preceding discussion, we can now present a model of the grammar of artifactual action, as shown in Fig. 2 in the previous page.

The model suggests that the elite in a society take the initiative for making interventions within a society<sup>14</sup>. Their experiments in intervention design go through the processes of ordering, typifying and correcting until particular interventions are defined. Change often follows interventions (at least, in time) but it need not have been caused by the intervention alone or may not have been caused by the intervention at all. It may have resulted from circumferences outside the system of intervention (s). An evaluation of the change effort would show some consequences of the intervention which the elite would then take into account to begin a new cycle of initiatives for change in a society.

It should be indicated that self-conscious use of theory and research in ordering, typifying and experiencing would not ensure appropriate intervention, and consequently, effective intervention and desired impact. The processes involved are highly complex. The realities may be badly ordered by a change agent. That is, his choice of the organizing model or theory may be unfortunate. The structuring provided by the model may be too general and simplified or it may be too narrow and segmental. Consequently, the model of reality that is developed may be flat and shorn of significant dimensions; and may miss the dynamics of a multiplicity of overlapping and intersecting systems. Value positions and particular propensities of individual change agents may blind them to some important structure and processes.

The change agent may have insufficient knowledge of theory and research in social and behavioural sciences and may not be able to apply what he does know in developing typical expectations about the social entities and processes of his concern. On the other hand, he may be so caught up with the typical that he may fail to come to terms with the existential realities. He may see a giraffe and say, "There ain't no such thing!"

Experiencing realities to apply existential corrections to stereotypes, typical expectations and blueprints, again, offers problems. On the one hand, the change agent needs to be perceptive—something that cannot

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<sup>14</sup>Bhola, "Notes Toward a Theory: Cultural Action as Elite Initiatives in Affiliation/Exclusion," *Op. Cit.*

always be taken for granted. On the other hand, the change agent cannot always study his world as systematically as he might wish to study. Not only are there pressures of time on the change agent, but also the individuals and groups often resent being studied, and institutions don't want any one to be snooping on them and taking notes

### *Choice of the Ordering Device*

The *Homo sapiens* are also *Homo theorans*<sup>15</sup>. Men define their personal identities, the world around them, and their relationships with this world through and in theorizing. They live and grow and die by theories. The change agent *qua* change agent must take his theories seriously. He must select appropriate models of change that, singly or in combination, would help him order the world of change in such a way that actual realities can be contained within his definition of the configuration, and appropriate change strategies can be designed

A whole range of models of social change are available in social science literature. These vary in their interests from historical and political change to individual change through clinical approaches. Each model offers its own prescription for ordering reality. Some of these models are inadequate, others unusable. Some of these are too general. Some others are models with narrow focii. They do not see enough of the real configuration of change and they do not see anything of the world immediately surrounding the change configuration.

We suggest that the *Configurational Theory of Innovation Diffusion* (or the CLER model)<sup>16</sup> can be an appropriate model for ordering the reality of a change situation. A complete elaboration of the model cannot be included here. The essential concepts of the model must, however, be

TABLE

		Innovators			
		Individual (I)	Group (G)	Institution (IS)	Culture (CL)
Adopters	I	I—I	I—G	I—IS	I—CL
	G	G—I	G—G	G—IS	G—CL
	IS	IS—I	IS—G	IS—IS	IS—CL
	CL	CL—I	CL—G	CL—IS	CL—CL

<sup>15</sup>See H S Bhola, "Acquiring, Storing, and Transferring Human Experience: Story to Theory Continuum," a paper available from the author. (Mimeo, July, 1975).

<sup>16</sup>H.S. Bhola, "The Configurational Theory of Innovation Diffusion", *Indian Educational Review*, Vol. 2, No. 1 (January 1967), pp 42—72.

stated. The CLER model suggests simply that the probability of a planned change event occurring depends on developing an optimal mix of four variables—configurational relationships between the innovator and the adopter systems (C); linkages *within* and *between* these systems (L), the environment (E) surrounding the change transaction; and the resources (R) available to the innovator system to promote the change and the adopter system to adopt it.

Configurational relationships (C) as conceived in the CLER model are a useful concept for ordering the world of change. Configurational relationships are taxonomized as shown in the Table (p. 55)

Change is seen to be occurring in overlapping and intersecting configurational relationships at the same time. Though configuration mapping any change situation of whatever complexity, can be structured in preparation for intervention. The delineation of Linkages within and between configurations articulates the dynamics of possible actions within the network of configurational relationships. The Environment variable draws attention to circumstances outside the boundaries of the change transaction, for sometimes outside events may be in the saddle and not the change agent. Finally, the variable of Resources enables the change agent not merely to organize for change but also to feed the fires of change.

The following characteristics of the CLER model as an ordering device should be stated

1. The CLER model is an intermediate level model. It is neither too broad and general nor too narrow and specific.
2. It is a comprehensive model. It presents a taxonomy of change situations which would cover all types of change events from hypnosis through organizational development, institution building to national charisma.
3. The CLER model is a useful tool for handling *structural ordering* as well as *time ordering* of reality. Through the concept of configuration mapping the reality of the world of change can be modelled to include all appropriate overlapping and intersecting social systems to reflect the true complexity of the phenomena of change.
4. Time ordering of the change phenomena into possible historical and future phases and cycles can be realized through configuration mapping (and by developing comprehensive CLER-profiles) at various points in time— $t_{-n}, t_{-(n-1)} \dots t_{-3}, t_{-2}, t_{-1}, t_0, t_1, t_2, t_3 \dots t_{1-n}, t_n$ .
5. The configurational maps thus developed would allow the change agent to deal with change at psychological, institutional and socio-cultural levels at the same time. Individual transactions could be

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(ERIC ED 011, 147). An updated version of the theory will be found in "Configurations of Change; An Engineering Theory of Innovation Diffusion, Planned Change and Development," available from the author. (Mimeo, 1972)

analysed within the settings of overall institutional transactions, which, in turn, could be illumined by the cultural and intercultural realities surrounding them. This would enable the change agent to move across levels, and concurrently apply psychological and sociological approaches. No dichotomous choices between the two levels of analysis would be forced from the beginning.

6. The concepts of second-order and third-order configurational relationships, also part of the CLER model, enable the change agent to go from mere constructs to his constituents in flesh and blood. The configurational mapping can be successively reviewed to move from social-scientific constructs of cultures, communities, institutions and individuals to real people working within specific institutions in a particular socio-cultural setting. The CLER model thus accommodates the possibility of existential corrections to be applied to the theoretically-ordered design of the change situation.

7. The CLER model not only orders the reality of the change situation in terms of various overlapping and intersecting configurational relationships, but it also orders the innovator system into the structure of these relationships.

All models have their special paradigmatic contexts. They are anchored in particular world views. They reflect particular sets of assumptions, and project particular value positions. Planned change, by definition, is not spontaneous. Communities may be ready, there may be discontent at the grass roots, but an "outsider" has to help for the change to come about. This model does make assumptions about the significant role of the elite in terms of the initiatives they take to bring about change within institutions and societies. This is an important value orientation of the model. But at another level, the CLER model does not take any value position. That is at the level of the choice of means to bring about change. The change maker is simply asked to optimize C, L, E and R. He may use approaches, both open and secretive, educational and manipulative, coercive and persuasive.

### *Developing Typical Expectations*

Once the world of change and the change agent's own relationship with the change situation have been initially ordered, the process of developing typical expectations about the change situation must be undertaken. Expectations about the typical behaviour of individuals, groups, institutional units, communities and subcultures in the configurational map must be developed; as also the typical expectations about the processes already taking place or to be generated within the change configuration.

Men learn from experience. They transfer their knowledge to new situations. Knowledge is transferred both intragenerationally and inter-generationally for collective wisdom to emerge. This has been an important mechanism for the survival of the human race. Human beings have used different devices for collecting, refining, storing and communicating human experience for collective use. The pre-literate man used story, metaphor, riddle and parable to do this. The literate man hypothesizes and engages in formal theory construction<sup>17</sup>. He tests his hypotheses and his theories. He not only accumulates and organizes experiential knowledge, he creates new knowledge. This knowledge is found systematized in the social and behavioural sciences such as anthropology, sociology, psychology, political science, economics, etc. Change agents must go to the social and behavioural sciences and apply social and behavioural science theory and research to their problem.

Applying social science research and theory for generating typical expectations about social entities and processes is, however, a complex task. First, it requires defining the real-life situation in particular social and behavioural science terms. The reality must not merely be ordered, it must be ordered social-scientifically. Second, suitable generalizations must be discovered in the social and behavioural science research that seem clearly to illuminate the situation. Third, these generalizations must be made meaningful by putting back into them the concrete details from the real-life change situation. Statements such as the following should result :

—The individual farmers in the Project area, being landless farmers, would show little interest in the techniques of improved production unless their share of the produce is proportionately increased, or unless their labours in the field can be significantly reduced, or made much less brutalizing.

—In the Project community, since acute economic deprivation prevails, literacy teaching, for likely success, should be rooted in the economic rewards that will accrue from the total programme.

—The institution collaborating in the change effort, since it is under attack from the outside and is being forced to manage with smaller and smaller budgets every year, will most likely be open to trying innovations that might strengthen its position.

—Since the recipient of technical assistance is a country with an economy of scarcity, there would be acute competition among candidates for selection for training abroad under the Project sponsorship; and people with powerful political connections, but not necessarily the most suitable, will be sent out abroad for training.

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<sup>17</sup>H.S. Bhola, "Acquiring, Storing, and Transferring Human Experience : Story to Theory Continuum", *Op. Cit*

There are problems involved in the process of this application. These problems may be characterized as follows :

1. The discipline-oriented organization of theory and research of social and behavioural sciences creates difficulties about storage and retrieval. Real-life problems are amenable most often to interdisciplinary solutions. They are not purely sociological or purely psychological or purely economical problems. They require interdisciplinary theory and research. We have not yet learnt how to organize interdisciplinary research and theory and where to look for it in literature and in libraries.

2. Generalizations relevant to the change situation, when discovered, are often too general. As Whitehead once said, a generalization is useful to have extent to which concrete details can be put back into it. It is not always easy for a change agent to put concrete details back into the generalization.

3. Again, while there is a lot of theory and research available in social and behavioural sciences that explains individual, group and organizational behaviour, there is not as much available in terms of a *technology* of making change. Research has not gone through the process of development to be put to work in making change interventions.

4. Finally, change occurs within many different configurational relationships. The CLER model, presented earlier, suggests sixteen different configurational relationships involving innovator and adopter systems. Each configurational relationship presents a particular category of psychosocial reality, demands a particular level of response from the change agent; and requires particular kinds of levers for generating planned change actions. Literature of social and behavioural sciences, of interest to students of change, is not organized for easy retrieval to relate directly to different configurational relationships and different factors that might be determinants of change within those configurational relationships.<sup>18</sup>

Thus, there are problems involved in applying social and behavioural science research to the ordered realities of the world of change for developing typical expectations about those realities. The task, however, must be performed, either intuitively or self-consciously and systematically. Change agents should feel obligated to use systematic approaches in developing these sets of typical expectations. Science must take over from pure intuition.

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<sup>18</sup> A project is now under way that will organize a review of theory, research and technology of innovation diffusion, planned change and development according to the conceptual structure of the CLER model. This arrangement would enable researchers and practitioners dealing with a specific configuration of change to go directly to a body of literature most related to their interest, for designing social interventions, for advocacy of causes and for planning of change. See H. S. Bhola, "Configurations of Change: The Framework for a Research Review," available from the author. (Mimeo, 1975).



### *Making Existential Corrections*

The knowledge of social and behavioural sciences will give us some hunches and some hypotheses about the change situation but not the truth about the living system that will actually confront us. It will tell us what we should expect to find but not exactly what we will find. Existential corrections will have to be applied to the set of conceptually-generated expectations. For instance, we will have certain expectations about individual behaviour but in the real change situation we may find both exceptional men and psychotics. We will have certain expectations about group and institutional behaviour but in real life we may find groups that are atypical and institutional arrangements that are unique. We will have expectations about the culture in which we will work but we may find ourselves working in an unrepresentative subculture of insecure or xenophobic elite. In such situations, the initial set of expectations will have to be revised or completely set aside.

What are the requirements for one to be able to apply these existential corrections? These requirements, we think, fall into two categories: (1) sensitivity and (2) science. On the one hand, a change agent needs to be sensitive and perceptive so that the subtleties of human interactions surrounding him would register on his mind, and on the other hand, he has to be scientific to be able to use objective methods of creating valid data *in situ* for reality-testing and for feedback.

### *On Being Perceptive*

Inevitably, we have to deal with the change maker himself as a person. Images of the future are carried in his head. He is perceiving the realities that surround him. The facts of the present are being processed under his skull as he intuits, deduces, analogizes, hypothesizes, predicts, tests, and revises descriptions and expectations. He is the instrument on which all music is made. His sensitivities, his perceptions, his discernments are crucial.

We know, however, that individuals are different. Therefore, it is reasonable to expect that individuals in change-making roles also differ from each other considerably, in their being perceptive. Some will attend an organizational meeting and would read the story of conflict and tension in the organization as if it was written on the wall. Others would notice nothing and would be deceived by correct and polite behaviour of the participants. Some would register minute changes in the emotive climate of a group that others would completely fail to see.

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<sup>10</sup>For just one such reference see Richard A. Schmuck and Matthew B. Miles, *Organization Development in Schools*, Palo Alto, Calif.: National Press Books, 1971

How does one become perceptive or more perceptive than he is initially ? In the literature of organization development<sup>19</sup> and TM (Transcendental Meditation)<sup>20</sup> there is much discussion on learning to get in touch with oneself, on perceiving the impact of one's own behaviour on others, and on learning to read individual states and group climates. We refer our readers to that body of literature on raising consciousness and self-awareness through which awareness of the other must arise as well.

### *On Being Scientific*

The change agent also must develop an *experimental* stance toward the change situation. For one, it would mean that the change agent enters the change situation with hypotheses but not decisions. The change agent should not seek quick closures ; and should avoid getting locked into particular positions by making loud statements of intent regarding goals, plans, and strategies. Finally, valid data must be collected *in situ* to objectify impressions and random observations, to test hypotheses, and to challenge positions. Where data cannot be collected, the change agent must consult with others around him to challenge individual perceptions and to test reality.

### *Strategizing for Action*

The change configuration, the world surrounding the change configuration, and the relationship of the change agent with this change configuration have been *ordered*. Utilizing knowledge from social and behavioral sciences, a set of *expectations of the typical* has been generated. *Existential corrections* have been applied to this set of expectations. But what does one do, then, to move a present situation (P) to a future situation (F) ? Does one bitch, shout, twist, yell, whisper, pat, praise, bribe, teach or persuade ?

It is conceivable that in a long-term planned change episode one would be doing all of these at different times, with different people. But all this to what effect ? What are we really doing when intervening to influence ? What is the moving force for individual actions ? What is the ghost in the social machine ?

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<sup>20</sup>See Maharishi Mahesh Yogi, *The Science of Being and the Art of Living*, London : International SRM Publications, 1966 ; also Anthony Campbell, *Seven States of Consciousness*, New York, Harper and Row (Perennial Paperback, p 289), 1974

*Using Power in Changing Power Fields*

Strategizing for social change means using social *power* (through various symbolic tools and tactics) so as to change a present network of power relationships into an alternative network of power relationships. To understand this statement, one needs an explanation of the concept of power and of its role in the dynamics of planned change

Elsewhere<sup>21</sup>, we have defined power as a universal and primary individual attribute and asserted that to *be*, is to be powerful. We further assert that *all* human transactions are power transactions. Since groups, institutions, and societies can be seen as systems of human interactions, all social organization can be defined in terms of power. Thus groups are power fields, institutions are power fields with formalized and articulated structures; and society is a power field "resulting from many power fields, informal and formalized, temporary and semi-permanent, coterminous with, built in, and built around each other, overlapping and intersecting at multiple planes"<sup>22</sup>

The primary human motivation is to experience power, but not always through exercising it on other human beings. Individual human beings define their identities through experiencing power, on certain scales, and through certain modes. Society develops structures and modes that accommodate or contain individual power needs, distribute power by ascribing it to some positions in the society and not to others, establish preferred modes of experiencing and exercising power, and create powerful agents that will ensure that power transactions are made according to rules. Significantly, power within a social system must always be unevenly distributed for any societal work to get done. Such a view of power can thus lead to a *sociophysics* which at the individual level can explain leadership, altruism, affection, guilt and deviancy; and at the societal level can explain the dynamics of competition and cooperation, stagnation and reform.

We can explain these apparently contradictory phenomena in terms of power transactions because power comes in many shapes and forms. It may be material power or symbolic power; it may be personal power or power ascribed to a position. Ever since man became a symbol user, power has been symbolically confounded and individuals can experience power within symbolically created systems of "reality". That is, that many in the same dance may indeed be dancing to different drummers? An individual may decide not to experience power within one symbolic system

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<sup>21</sup>Bhola, "The Design of (Educational) Policy," *Op. Cit.* Also Bhola, "Power: The Anchor of Stability, The Lever of Change," *Op. Cit.*

<sup>22</sup>*Ibid.*

since he is experiencing greater power in another symbolic system and is thrilled with the experience.

To change an existing power field to a new one will mean a perturbation in the present field, articulation of a new power field and its refreezing. In so doing, the power of some individuals may have to be neutralized; the power of some others may have to be increased, it may involve both conflict and coalitions. To strategize is to manipulate Power, both for cooperation and conflict, to ensure that societal tasks will get done.

### *Concluding Remarks*

The preceding has been an attempt at theoretical speculation. It is not a theory that came off full-blown. Some of the ideas integrated here have been developed over the years. Some of the elements of the grammar presented above have already been put to use and found *not* wanting in solution-invention. Yet these and other ideas presented above must be tested further. Available hypotheses and findings in the literature of change must be re-examined in terms of this sociophysics. These challenges must be met by students of change together as a professional community.

# Review of Foreign Studies on Sexist Bias in School Experience

(Mrs) K. N I S C H O L

SEX education and sexism, often, are considered synonymous in India. Whereas the former deals with development of healthy attitudes and values towards the opposite sex, the latter implies the reinforcement of social expectations with regard to male and female behaviour and goals. When the society lays down discriminatory norms and assumes that the future destiny of men and women is different, it introduces sex as a dimension of inequality. One might very well ask : Is it not the right of every individual to attain maximum development according to his or her abilities, desires, efforts and aspirations and should one's development be warped and influenced by social or sexual role prescribed by the society ? In India, although the legislation ensures equality of opportunity to all regardless of caste, creed or sex, yet the perceptible gap between law and observable behaviour exists on account of continual disregard of those factors operative in homes and the society which reinforce traditional discriminatory sex-stereotypes.

In the Western developed countries over the last decade, attention of people has been drawn to the detrimental influence of sexism on human development. Several studies have attempted to assess the extent to which conscious and unconscious school experiences lead toward differential outcomes among boys and girls. The general indication of these studies is that the element of sexism present in the educational system, tends to warp the full development of growing boys and girls, besides transmitting unrealistic role images of adults in society. Multifarious factors operating

at home and in the society result in observable differences between behaviour and goals of boys and girls. Nevertheless, formal schooling during the most impressionable and formative period of a child's life leaves a lasting affect upon the child's attitudes and opinions. The researches abroad, to cite a few, give enough support to the fact that a major source of unintended teaching about sex stereotyped roles is present in educational material. Though micro in nature and relatively unsophisticated these studies highlight: (a) the subtle and imperceptible transmission of future sex roles expected of boys and girls through the process of teaching, and (b) The unrealistic portrayal of women and men that schools are perpetuating through role models presented in educational material.

In most of the cases, the reported foreign studies are on textbooks in different subjects. This field of study has been chosen primarily because textbooks are the repository of handed-down knowledge of socially desirable attitudes and values. Their contents are influential especially during the formative period of the children who value the adult characterization in the books because (a) the models they provide against which the children can measure their own parents and other familiar adults; (b) the model they provide of acceptable behaviour to which children may aspire as they grew older.

Almost all such studies indicate that women and girls, also men and boys, are portrayed in school readers in conventional sexstereotyped roles thereby warping an individual's natural proclivities. In fact, the children are crippled by "the latent content" of their textbooks that convey unrealistic images of characters in limited roles. Such rigid sex role-stereotyping giving restricted portrayals of boys and girls tends to create an artificial barrier between males and females.

Besides the limited portrayal of both sexes, sexist bias is prevalent in textbooks where male role models overwhelmingly overshadow the female role models to the extent that "in young children's readers and school texts, male characters appear from two to four times as frequently as female figures." The omission of women and the tendency to treat them as male satellites is a graphic illustration of the "social invisibility of women and girls."

Other than ignoring and neglecting female characterization, the presentation of female characters wherever given tends to perpetuate anti-feminine prejudice. The finding of studies abroad point out that "women and girls are characterized as being gentle, timid, indecisive, conforming, self-sacrificing, domestic, physically weak, emotional, docile and fearful in stress or peripheral, unimportant and as poorly defined characters—most often activated by or the object of a male character's plans and activities." Their existence, as such, is shown as relational or functional and often as "being less than full human being" needing male support and assistance.

As "passive watchers" in a society created and controlled by men, the women are hardly shown as productive citizens. They are categorized as a special "sub-group", and mentioned only when, they differ from norms of expected behaviour laid down by men.

The "neutral" or "negative" characterization of the female in roles that are either exclusively functional or of evil character like witches, or, of a clumsy, stupid or foolish object, is far removed from the realistic role of women in the developed western society. One could opine that in the event of such contradiction between adult models in society and role models presented in the curriculum, the growing children would naturally fail to hold up any ideal for emulation—in fact, they would be unable to give any definite direction to their life. The possibility would be of their developing a sense of fear and guilt as to whether by emulating adults in society they stand to lose their "femininity-masculinity".

Furthermore, the textbook contents, as reported in the foreign studies, limit and sex-type the range of occupations open to women. In an interview with the principals of colleges for further education, the British Commission reports :

Such traditional views on the Limited occupational choices of women could possibly account for the low level of aspiration in regard to the type of employment women seek. Society at large seems to promote low expectations for women in career terms which in turn limits the ambitions of individuals. The home, the school, the office and the factory reinforces these views.

In view of the existing and predicted changes in job opportunities and participation of women, the reinforcement of traditional views appears out of context. In today's world, economic necessity, smaller families and emancipated views of women result in their spending more than half of their life-span in some form of gainful employment outside home. To what extent, therefore, are we justified in transmitting to the growing female generation in the existing society that women are passive, dependent housewives, defined by their husband's occupations—giving a general impression that women do not work outside their homes? Such impressions get conveyed when most female characters in textbooks are portrayed in a variety of domestic roles and rarely as professional career women excepting in a limited number of contemporary occupations, e.g., nurse and teacher, etc. Significant to note is that whereas all men are shown in occupational roles outside home, almost all women are shown as "positive" mothers happily engaged in domestic chores inside the home, feeding and educating their young ones.

Such portrayal of women was befitting when a decade ago the socie-

ty's expectations were clear-cut and crystallized regarding the roles of men and women. However, today, when choice of occupations is not based on sex, unrealistic demarcation of roles in literature would vitiate the purpose of offering adult role images to the sexes compatible with today's world.

The society's views on the "commendable" qualities on women are also conveyed through female characterization in textbooks. Several studies reveal that females in society are rewarded for their "beauty and youth", their capacity to serve and please other, their acceptance of male physical/mental superiority and their ability to be "good mothers". Evidently, the society is not looking for actions or achievements from women. Their femininity and submission win for them their highest reward of "marriage to rich, strong man of high position."

On the other hand, treatment meted out by the society to female characters in textbooks is not always rewarding. Several studies, in their analyses portray

- (a) Female characters are victimized, humiliated and attacked as a female class.
- (b) Female characters calmly accept derogatory remarks simply because they are "female".
- (c) Female characters are held up as objects of derision, e.g., lack of "grey matter", etc.
- (d) Female characters are shown as producing nothing but children, as well-fed, procreating machines, content as consumers and recipients of gifts.
- (e) Female characters are parasites—spending their leisure hours in idle gossip, quarrelling or shopping.

The only positive portrayal of female characters in textbooks appear to be in the role of a 'mother', within the four walls of a home. Reflecting social expectations, the female characters are expected to attend to the comforts and needs of the family-group in order to project the image of a "perfect marriage". The message seems to be clear, "Back into the home with the unselfish female and out into the world with the self-seeking male."

The presentation of such role models is obviously an attempt to condition the growing female generation to sex roles of a "conventional" society and not into realistic sex roles in the up-and-coming "individualistic" society.

Summers, commenting on sex-stereotyping in history books, says:

Most Australian history works are so closed, so suffocating, so self-assured in their preoccupations with the activities of man, that such



questions (as omission of women and their contribution to society and social change) could not even occur to the readers. *To read them is to be lulled into the false assumption that women did not even exist.*

Studies, other than those on textbook contents, have been conducted in the Western countries which support the earlier findings of sex-role stereotyping. One study evaluating illustrations in textbooks mention that in lower grade textbooks, out of a total of over 8,000 pictures, more than 5,500 are of males. With each successive year, the percentage of female illustrations decreases.

In a few illustrations, both women and girls are shown as "passive—watching and waiting for boys." When engaged in any activity, it is primarily in indoor tasks involving domestic roles and as mothers, or infrequently, in severely limited occupational roles. The illustrations of women are expressive, in fact, overexpressive of emotions, indicating thereby that it is "feminine" to overtly express one's feelings.

Another aspect of school life, viz. athletic programme, was studied and the report indicates that "schools reflect traditional sexist views of the society". Although this study was conducted in only one school, the findings tend to support that the principle of "sound mind in a sound body" does not apply to females in the school situation. Consequently, a passive attitude in sports is forced on females in the higher classes creating a false impression that "women have no place in sports." As a result, participation of girls in sports is considered "unfeminine" and all of their "human potential" is not developed.

Even with regard to school expenditures on sports items, more money and importance is given to athletic activities in which boys participate. Also male coaches are paid higher salaries than other members of the staff entrusted with extra-curricular duties. Existence of organizations/clubs exclusively for men and women also clearly reflects discriminations.

Another study on the attitude of school personnel reveals that

- (1) girls and women are accorded unequal treatment by male teachers in the classroom and the tradition of "chivalry" continues to persist ;
- (2) at school functions where parents volunteer to help, the mothers do chores for which no thanks is expected or given whereas fathers undertake "serious" or "high status" jobs for which they receive a great deal of praise.

Even with regard to appointment in the educational field, sex discrimination exists as regard pay scales, assignments of duties and classes, etc.

According to one study, (a) at the highest administrative level only 26.5% of the personnel are women, and (b) jobs are highly sex-stereotyped e.g., 99% of office employees and cafeteria workers are women. Furthermore, the number of women administrators and teachers is the highest at the early elementary level, decreasing through junior and high school.

### Conclusion

As reported in various foreign studies, conscious and unconscious school experiences of children tend to reinforce sexist bias by demarcating for boys and girls differential outcomes which are socially acceptable. Evaluation of school experiences of children in India has yet to begin and we who are so bound by conventions need to be careful in portraying realistic role models if we desire the full development of our children. It is, therefore, desirable for educationists in India to wake up the situation where sexism exists in experience at the formative period of a child's life. In an area where law ensures equal opportunity for all, irrespective of caste, creed or sex, it would be certainly worth while to review the situation at schools where every child spends his/her maximum time during the formative period. What is required is not reversal of sex roles but the acceptance that both boys and girls are human beings with some potential which, when given proper environment and encouragement, 'can be actualized. This would enable each child to develop into a "full human being."

The preparation of non-stereotyped readers, textbooks and other teaching materials for all levels of schooling is extremely important. Nevertheless, this is only one step in changing the image of women in society and not an end in itself.

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# Acquisitions of Algebraic Concepts in the Pupils of Grades VI-VIII in Relation to Sex, Grades and Intelligence

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MODERN trends in the field of curriculum development (Mendenhall *et al.* 1960, Fraser 1962, Roberts 1966); learning and teaching theories (Fehr 1953, Cage 1964, Bruner 1964, and Dutton 1964), and the objectives of teaching mathematics have contributed to the added emphasis on the task of building up conceptual understanding of mathematics in pupils instead of concentrating major efforts on the drilling of computational processes alone.

Consequent upon Piaget's works, keen interest has been taken by the psychologists in the study of development of concepts but despite that very few useful answers to our questions relevant to classroom teaching could be provided by them.

In the present investigation an attempt has been made to ascertain the status of algebraic concepts in pupils of sixth, seventh and eighth grades in relation to sex, grades and levels of intelligence. Carlsmith (1964), Weaver and Gibb (1964), Overholt (1965), NIE-HEW project 009 (1963-65), and Sheehan (1963) reported sex differences in the understanding of mathematical knowledge. Working in the field of mathematics, Blair and others (1962), Hurlock (1964), Crawford (1965), Baumann (1966)

and Begle (1968) reported that the grade level was significant in the understanding of mathematics, may be due to maturity, greater guidance, and more exposure to the curriculum. Superior intelligence was found to be associated with more effective concept attainment by Osler and Weiss (1962), Hammond (1962), Shimizu (1963), Crawford (1965), and Overholt (1965).

The research evidence cited above led to the testing of three hypotheses, (1) sex differences accounted for significant variations in the understanding of algebraic concepts; (2) the levels of instruction, varying according to the syllabus in algebra for each grade, contribute to the significant variance on account of the variations in the understanding of algebraic concepts; and (3) the acquisition of algebraic concepts in pupils depends on their level of intelligence, that is, superior intelligence accounts for better understanding of algebraic concepts.

## PROCEDURE

### *Design*

In view of the three hypotheses, a factorial design of three-way analysis of variance was employed. The three variables involved in the study were: grades varied in three ways, sex varied in two ways, and the levels of intelligence varied in two ways—the high and low intelligence groups. The criterion variable was taken in terms of total algebraic concepts scores. The four-way analysis of variance was also employed by varying the concepts in seven ways besides the variables mentioned above.

### *Sample*

A multi-stage randomization of clusters was used for the sampling in which one classroom was considered as the unit of sampling. The sample consisted of 1,300 boys and girls in the sixth, seventh and eighth grades from the schools of Panjab, Haryana and the Union Territory of Chandigarh. The scores in the cells of analysis of variance design represented the random cases, mutually exclusive of one another drawn from the total sample of 1,300.

### *Tools Used*

A. C. Test : The Algebraic Concepts Test was locally developed in the absence of any such tool for evaluating the understanding of algebraic concepts. The final test consisted of 70 items representing seven broad

categories of concepts corresponding to generalized numbers, directed numbers, equations, parantheses, substitution, exponents, and graphs. The re-test reliability of the test ranged from .77 to .92 for different groups, namely (i) girls in each grade, (ii) boys in each grade, (iii) girls and boys in each grade, and (iv) the total sample. The internal consistency, taken in terms of inter-concept correlations, varied between .22 and .65. The concurrent validity coefficients against teachers' evaluation ranged from 50 to 71. The time-limit for the test was set at 45 minutes after its two administrations on different samples.

Jalota's (1960) Group Test of General Mental Ability (1/60) : The test comprises 100 items to be completed in 20 minutes' time. It includes the elements of vocabulary, number series, classification, best answers, inferences, and analogies. The reliability of the test was reported to be .938 as the lower limit and its concurrent validity coefficients ranged from .50 to .73 by taking the examination marks as the criterion.

### *Collection of Data*

The A C Test and the Group Test of General Mental Ability were administered simultaneously to a sample of 1,300 boys and girls in the sixth, seventh and eighth grades towards the close of the session. The tabulation of scores was done for boys and girls separately in each grade.

### *Analysis of Data*

After having checked the normality of distribution in the criterion variable, the need for arranging the data according to the design was felt. The girls and boys in each grade were classified as upper and lower intelligence groups by taking 27 per cent top and bottom cases on the variable of intelligence. The algebraic concepts test scores were then arranged for each group. Twenty cases were picked up randomly from each group representing the high and low intelligence levels. The sub-groups were tested for homogeneity of variance by applying Bartlett's Test. A summary of analysis of variance ( $2 \times 3 \times 2$ ) design involving 240 cases is entered in the following table.

## ACQUISITIONS OF ALGEBRAIC CONCEPTS

TABLE 1  
SUMMARY OF ANALYSIS OF VARIANCE ( $2 \times 3 \times 2$ )

Source of Variation	Total Sum of Squares	df	Mean Square Variance	F
Sex (S)	2826.9	2	1413.45	52.7**
Grades (G)	781.3	1	781.3	29.2**
Levels of Intelligence (I)	4851.1	1	4851.1	181.00**
G $\times$ S	159.2	2	79.6	2.97
I $\times$ S	23.4	1	23.4	—
G $\times$ I	175.3	2	87.65	3.27*
G $\times$ I $\times$ S	14.0	2	7.0	—
Error	6100.8	228	26.8	—
Total	14932.0	239		

\*Sig. at .05 level

\*\*Sig. at .01 level

Just for the theoretical interest, the results of the three-way analysis of variance were compared with the results of the four-way analysis of variance, in which the seven variations due to concepts were also introduced. A summary of four-way analysis of variance ( $2 \times 3 \times 2 \times 7$ ) involving 420 cases is given in Table 2.

TABLE 2  
SUMMARY OF ANALYSIS OF VARIANCE ( $2 \times 3 \times 2 \times 7$ )

Source of Variation	Total Sum of Squares	df	Mean Square Variance	F
Sex (S)	106.0	2	53.0	19.41**
Grades (G)	14.8	1	14.8	5.42*
Intelligence (I)	120.5	1	120.5	44.14**
Concepts (C)	313.4	6	52.23	19.13**
G $\times$ I	18.2	2	9.1	3.33*
G $\times$ C	85.2	12	7.1	2.60**
G $\times$ S	0.5	2	.25	—
I $\times$ C	21.2	6	3.53	1.29
I $\times$ S	0.4	1	0.4	—
C $\times$ S	18.9	6	3.15	1.15
G $\times$ S $\times$ I	.3	2	.15	—
G $\times$ I $\times$ C	34.0	12	2.83	1.04
G $\times$ S $\times$ C	30.3	12	2.53	—
I $\times$ S $\times$ C	77.5	6	12.92	4.73**
G $\times$ I $\times$ S $\times$ C	26.3	12	2.19	—
Error Variance	916.0	336	2.73	—
Total	1783.3	419		

\*Sig. at .05 level

\*\*Sig. at .01 level

Each of the three hypotheses was further tested by involving all the 1,300 cases and by applying different techniques. The sex differences were examined by using the significance of difference between the mean scores of girls and boys in each grade and the total sample, the results of which have been shown in Table 3. The grade differences were also tested for significance between the mean scores on A.C. Test between (i) sixth and seventh grades, (ii) sixth and eighth grades, and (iii) seventh and eighth grades, the results of which have been given in Table 4. The relationship between intelligence and algebraic concepts was established by using correlations. The results have been given in Table 5.

TABLE 3  
SIGNIFICANCE OF DIFFERENCE BETWEEN THE MEAN SCORES  
OF GIRLS AND BOYS ON THE A.C. TEST SCORES FOR GRADES  
VI-VIII AND THE TOTAL SAMPLE

Grades	Sex	Mean	SD	N	SED	OR
VI	Girls	16.94	5.53	170	5708	3.71**
	Boys	19.06	5.73	225		
VII	Girls	18.01	7.14	195	6810	7.81**
	Boys	23.33	7.46	275		
VIII	Girls	24.59	8.49	150	9030	4.04**
	Boys	28.24	9.77	285		
Total	Girls	19.61	7.807	515	4656	9.19**
Sample	Boys	23.69	8.788	785		

\*\*Sig. at .01 level

TABLE 4  
SIGNIFICANCE OF DIFFERENCE BETWEEN THE MEAN SCORES  
OF VI-VII, VI-VIII AND VII-VIII GRADES  
ON A. C. TEST SCORES

Grades	Mean	Sd.	N	SED	O.R
VI	18.15	5.742	395	4608	6.44**
VII	21.12	7.783	470		
VI	18.15	5.742	395	5397	16.36**
VII	26.98	9.508	435		
VII	21.12	7.783	470	5803	10.10**
VIII	26.98	9.508	435		

\*\*Sig. at .01 level

TABLE 5

COEFFICIENTS OF CORRELATION BETWEEN A.C TEST SCORES  
AND INTELLIGENCE SCORES FOR GIRLS AND  
BOYS OF GRADES VI-VIII

GRADES	VI		VII		VIII	
SEX	<i>Girls</i>	<i>Boys</i>	<i>Girls</i>	<i>Boys</i>	<i>Girls</i>	<i>Boys</i>
r	4789**	3418**	2218**	4317	6294**	4553**

\*\*Sig at .01 level

#### DISCUSSION OF RESULTS

The first hypothesis aimed at testing the sex differences in relation to the understanding and development of algebraic concepts. The three-way analysis of variance revealed that the sex accounted for significant F-ratio ( $F=29.2$ ,  $df \frac{1}{228}$ , Table 1). Similar result was obtained by the application of four-way analysis of variance (Table 2). Girls and boys differed significantly when tested further for significance of difference between their mean scores on total algebraic concepts test. The C.R.'s of 3.71, 7.81 and 4.04 for the sixth, seventh and the eighth grade girls and boys respectively were found to be significant at .01 level. The girls and boys differed significantly in the total sample as well (C.R.=9.19, Table 3.) The mean scores of boys were higher than those of girls at each grade level. The results imply that the boys tend to understand algebraic concepts better than the girls, provided all other extraneous variables are held constant. These findings are in agreement with most of the research evidence of this nature. Carlsmith (1964) raised the issue of sex-tying on a test of scholastic achievement and found that boys scored higher than girls in mathematics but lower in verbal section. NIE-HEW Project 009 (1963-65) also reported that boys did better than girls in mathematics. Overholt (1965) pointed out that boys achieved higher scores in arithmetic achievement and arithmetic concepts than did the girls. Sheehan (1968) was of the opinion that sex difference contributes to the difference in learning to solve algebra problems. Weaver and Gibb (1964) reviewing research on elementary mathematics quoted various sources to establish that boys were superior in problem-solving, in transfer of learning and in reasoning to girls and as these are essentials in concept formation, so such differences might have been perceptible in the present investigation as well. Uneven intelligence may also account for such differences between girls and boys. This point was, however, not touched in this study. Occupational aspirations may play the vital role in exhibiting sex differences



in mathematics achievement. The boys attach a greater importance to science and mathematics than the girls do because of the service and employment potential and are likely to take greater interest in these subjects than the girls who ordinarily avoid mathematics and science from the occupational point of view

Evidence in support of the second hypothesis was available from the results of three-way analysis of variance. The contribution to variance due to grades was found to be significant at 01 level ( $F=152.7$  for  $df \frac{2}{223}$ ,

Table 1). It was equally supported by the four-way analysis of variance ( $F=19.41$ ,  $df \frac{2}{336}$ , Table 2). The differences between the mean scores of sixth and seventh, sixth and eighth, seventh and eighth grade pupils on the total Algebraic Concepts Test scores were found to be significant at .01 level (Table 4). The mean scores of 18.15, 21.12 and 26.98 for the sixth, seventh and eighth grade pupils respectively, showed an increasing trend in the development of algebraic concepts from grade six onwards to grade eight. The levels of instruction seem to play an important role in explaining the better understanding of algebraic concepts from lower to the higher grades. The pupils in the higher grades are exposed to wider syllabuses than the pupils in the lower grades and obviously get greater amount of guidance and training which helps in having better understanding and development of algebraic concepts. Hurlock (1964) points out that concepts vary according to the amount of guidance and training the child receives. Blair and others (1962) are of the view that the level of conceptualization depends more upon educational experience than upon intelligence. The pupils in the earlier grades seem to form the "mobile frames" which get stabilized in later grades with more experience, guidance and training and maturity. Schooling therefore, seems to be a significant factor contributing to variables in the understanding of algebraic concepts from one grade to another. Leake (1965), in the absence of schooling, did not find any difference between the mean scores of grades on probability concepts. As against it, Crawford (1965) found that mean scores for the understanding of field axioms increased significantly from one even number of grade to the other. Baumann (1966) and Begle (1968) also favour the effect of schooling in the understanding of concepts. Martin (1951) and Osler and Weiss (1962) attributed better understanding due to age.

The third hypothesis was tested to see the trend in the development of algebraic concepts in girls and boys at each grade level in relation to intelligence. Correlational technique was employed for this purpose, after having established the significant F-ratios by using the three-way analysis of variance and four-way analysis of variance. Levels of intelligence

(upper and lower) accounted for F-ratio equal to 181.0 for df 1/228, which was found to be significant at .01 level in the three-way analysis of variance. The four-way analysis of variance also yielded significant F-ratio of 44.14 for df 1/336. The result of the analysis of variance convincingly supported that levels of intelligence accounted for the significant differences in the understanding of algebraic concepts by the junior secondary pupils. The grade-wise correlations between the total algebraic concepts scores and intelligence scores were all significant at 01 level (Table 5). The results lead to the inference that superior intelligence does help in accounting for the higher scores on the Algebraic Concepts Test. It was found that the upper intelligence groups of pupils had higher mean scores than the lower intelligence groups had. In the seventh grade there seemed to be maximum difference between the upper and lower intelligence groups, which explains the significant interaction due to grades and intelligence in the three-way analysis of variance and four-way analysis of variance. These results are in agreement with those of Osler and Weiss (1962) who reported that under non-specific instruction, superior intelligence was associated with more effective concept attainment and superior intelligence had an advantage in problem-finding phase of the task. Hammond (1962) maintained that intelligence accounted for achievement and that mental ability and mathematical ability were significantly related. Shimizu (1963) reported that there was an increase in responses of conceptual type as a function of increasing mental age. Crawford (1965) pointed out that intelligence had an increasing effect on the understanding of field axioms as the grade level increased. A similar result was reflected by the present investigation, wherein interaction due to grades and intelligence was found to be significant. Overholt (1965) observed that conservers achieved significantly higher scores on the intelligence tests than did the non-conservers in the achievement of arithmetic as related to the attainment of the concept of the conservation of substance. Graft (1966) was of the view that greater understanding and greater transfer for the average and above average had been provided by the new mathematics programme. Likewise, Baumann (1966) found that the level of IQ was significant for some concepts. Mishima and Tanaka (1966) held that the hypothesis testing procedure used in concept formation were characteristic not only of intelligent children, but also of mature children. Carolyn and Keisler (1967) established significant correlation between mental age and the acquisition of the difficult multiple hypothesis strategy. The results when referred to in the light of the above mentioned findings reflect that the superior intelligence seems to account for better understanding of the algebraic concepts in general.

This can be understood in the light of the fact that concept attainment is a cognitive process and largely depends upon the change-over

from sensory-motor intelligence to reflective intelligence. Concepts, according to Vygotsky (1962) are active part of the intellectual process, constantly engaged in serving communications, understanding and problem-solving. Hurlock (1964) is of the opinion that "with maturation of intelligence especially in the areas of memory and reasoning, the child's ability to develop concepts increases". Levels of intelligence, therefore, affect the attainment of concepts and superior intelligence accounts for better understanding of concepts which is equally true in the present investigation.

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# Scientists and the Science of Management on Managing the Knowledge Workers

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IN the developing countries science must form the infrastructure for the economy, and the State has to play a pioneering role in the promotion of scientific research and development since private enterprises fail to have "the desire, foresight or means sufficient enough to champion the cause of science to the extent socially necessary" (Chowdhury, 1973). For this there is need for national confidence, its lack prevents the growth of risk taking in industrial ventures and promotes chronic dependence on outside aid and collaboration

During 1970-71, 85.9 per cent of expenditure on science was borne out by the Union government as against 7.5 and 6.6 per cent by the state governments and private sources respectively. Even then the picture is not so rosy in terms of percentage of GNP although it has doubled in the last decade. The Union government expenditure is 3.12 per cent (in 1970-71) on R & D of the total government budget. As compared to other countries we employ a large number of scientists (third in the world) but our per capita expenditure on science is much lower. We spend more on the personnel than on other things and hence productivity is much lower.

There might be other reasons also. Atma Ram (1973) has sternly remarked that the administrative structure of science department is "suffocating". He feels that there were bureaucratic bottlenecks and young

scientists could be involved in decision-making. Although some of these problems are because of the structural arrangement but we could not overcome "human deficiencies" with "structural alterations". Atma Ram feels that Indian science today suffers from a "crisis of quality" and the "administrative and management structures" are not to be squarely blamed for it. Sarabhai (1966), on the other hand, held "social factors within organization" responsible for obstructing the innovations in science not the "absence of technological know-how or equipment". The Third Reviewing Committee of the CSIR (1964) reported that industry in India was not inclined to accept indigenous know-how and technology as against the imported technology. Industries in India, both in private and public sector, were not "research-minded". "It is yet to acquire the discriminating wisdom of taking reasonable risks in cases where Indian know-how may be able to supplement a foreign process or even to improve upon it."

The Committee has recommended for "special care to offer them (scientists) such incentives, atmosphere for work, conditions of service and freedom to choose their work..." Even this recommendation is not without strings. The freedom to choose assignments and work has to be "within the overall programme and priorities". The Committee wants these institutions to offer them the cake and not let them eat it. The Committee does not care to recommend changes in the bureaucratic set-up and the procedures followed by these institutions. Without going into the actual working of these institutions the Committee recommends (like all other review committees in the past): "for scientific and research staff the system of achievement or performance cards giving details of his attainments in his field of work should be introduced." They were perhaps not very serious because in the present set-up attainment appraisal will be biased and would depend on the senior members of the staff who hold the reign of administration. The system of writing confidential report is very much there.

India has the third biggest research community and output is only one-third of the world average. Range Rao (1972) has estimated that the same individual who is one-third of the world average attain  $1\frac{1}{2}$  times average when abroad. Chawla and Jain (1973) while analysing the reasons for lower productivity of Indian scientist (in India) have blamed not only lower emoluments and pay differentials but also the hierarchy that has "emerged because the structure itself is vertically organized with a good deal of pomp and prestige attached to higher and higher posts." This kind of system gives rise to Lysenkoism. "Top scientific managers need not necessarily be top scientists."

## EFFECTIVE MANAGEMENT OF SCIENCE

*Need for Autonomy*

Research and development, the primary function of science, is "linked with change, its work leads to a change in products or methods and its own interest and projects are constantly changing. Change demands flexibility." Limiting the span of control may lead to large number of levels of authority resulting in distance between the departmental head and man at the bench (Collinson, 1964). But Pelz (1969) is against complete autonomy because "high autonomy did not necessarily produce higher than average." Allowing some weight in deciding own goals leads to better performance. In another research with medical scientists he (1956) concluded that colleagues were important. He also observed supervisors "who avoid either isolation or domination" also helped these scientists in their pursuits. Mellinger (1954) has emphasized the role of factors like trust in discussion among scientists. Vaidya (1973) feels that it will help if things such as promotion policy, sabbatical housing, funds, etc. are provided and there is proper grievance-handling and appointment of professional manager is made to head the institutions. Describing the creative scientist as "a non-conformist", Srinivasan (1973) feels that our research organizations are too rigid, too hierarchical and too vulnerable to pressures of all kinds. Tendency to take risks is essential for utilizing the new know-how. Unless it is there, there will be persistent lack of encouragement to the growth of R & D.

*Supervision*

Likert (1969) has cautioned that the scientists frequently meeting the Chief had better performance. He has, however, emphasized the need for maintaining an independent frame of mind for better performance. He feels that the role of leadership was very important. Indira Gandhi (1970) has also voiced the same feelings.

The research scientist has to exercise independent judgement and maintain consultative contact with the supervisor. Supervision here is rather a difficult and delicate issue. Subordinates are technically qualified and competent and they have to be given freedom of movement. Evans (1969) has suggested the concept of "working supervisor" in such situation. Talents required for such supervision are . (1) communication skills ; (2) sense of order , (3) willingness to make decisions and assume responsibility , (4) motivational ability ; and (5) integrity.

Rahman (1972) has made distinction between two kinds of authority systems—executive authority and colleague authority. While the executive authority is based on status difference, in the colleague-authority system it is shared by all in the work-group. In the executive authority system participation in the decision-making is barred for subordinates; bosses are paternalistic and they manage by dominating. In colleague-authority system scientists participate in decision-making; have a means to authority; and they are “managed primarily through persuasion”.

### MANAGEMENT OF CREATIVITY

#### *Indicators*

Evans (1969) has mentioned indications of creativity as: (a) dedication and devotion to work; (b) dissatisfaction with existing conditions, (c) interest in being thoroughly informed, (d) interest in new concepts; (e) desire to work alone on a new concept, (f) perseverance through crises, (g) doing job in his own way, and (h) insistence upon exact answers.

#### *Creative Climate*

Knapp and Goodrich (1952) have analysed American Man of Science and have observed that “early training in self-discipline, and independence of thought and actions, which can be associated with family religious traditions, are associated with likelihood of mention in American Man of Science.

Gerstenfeld (1970) has given an elaborate model of creative climate interlinking organizational variables with individual variables. Organizational variables are climate variables requiring challenge, goal-setting, feed-back, reward, recognition, openness and allowance for conflict, job enlargement, involvement, and less of conformity. These are all ingredients of a creative climate but what predicts creative performance is intelligence, previous creative acts, commitment to internal standards, and evidence of persistence. These individual variables actually lead to creativity.

What Collinson (1964) thinks necessary for creative environment are: (a) freedom of actions; (b) creation of sense of urgency, (c) environment of activity, purposefulness and confidence, (d) recognition; (e) challenge; (f) non-conformist; anti-organization individual, (g) self confidence, and (h) a sense of urgency.



In team work (in research laboratory) length of association of group members was more important (Shepard, 1955).

### *Personality*

Berron (1955) in a study found that among his subjects those who were more original showed a stronger preference for complexity and greater rejection of authority Stein (1955) while comparing two laboratories with varying climate found that different personality characteristics were related to creativity. Guilford (1950) while denying evidence for association between intelligence, education and creativity, has found several mental abilities important in creativity; sensitivity to problems, ideational fluency and novelty, flexibility of mind and analysing-synthesizing ability, etc.

### MANAGEMENT OF MOTIVATION

For productivity in science, the age-group 30-40 years seems to be ideal (Lehman, 1953). Peter (1957) did not observe decline in productivity of scientists with age. Pelz (1955) found that high motivation was encouraged by controlled freedom, giving considerable autonomy coupled with frequent progress reports, staff meetings, and meetings with clients. Chief's motivation and ability for the attainment of goal was found to be associated with subordinate's motivation. In the study of medical research scientists by Baungartel (1955) democratic leadership was found to be more successful. McClelland (1955) suggests that need for achievement as against a desire for success or recognition was more important for a successful outstanding scientist. A desire for proving ability by undertaking calculated risks of uncertain outcome was also present.

Davis (1954) found that there was association between research performance and individual's orientation towards science. Style of supervision and sense of group membership were also important. Comparing social scientists with natural scientists Roe (1952) found that the former were more gregarious. Independence at an early age was found to be a significant factor in the life of scientists.

Wesehler *et al.* (1952) compared scientists under restrictive and permissive leadership on job satisfaction and performance. Scientists under permissive leadership were rated higher than those under restrictive leadership. Although with lower job satisfaction the latter group had similar productivity.

In a comparative study of 800 research and other engineers, Peter (1957) observed that the research engineers had "more unusual ideas". They tended to rate lower tolerance of frustration and attached lower importance to social know-how. Masculinity was negatively associated with success in science. They had high interest in ideas and theory, and the lowest interest in people.

#### MANAGEMENT NEEDS

The management of research and development is in fact the management of people in the organization. Of course, in the research and development organizations, the management of scientists and technologists with their special demands of working, creates problems which need special consideration. It is inevitable that there will be conflict between the inherent nature of man which leads to change and innovation and the tendency for any system or organization to become progressively more rigid and hierarchical (Collinson, 1964). For the management of research and development organizations flexibility is essential. The values of experience and the established system is outweighed against the advantages of a fresh mind and creative approach because for innovation and change it is not necessary to have only experience and established system but we need imaginativeness and creativity of the mind which has to ultimately solve the problem. In such organizations there is clearly defined goal and all activities have to lead to the attainment of this goal. Responsibility has to be divided according to the situation in which one has to function. While dealing with process development, application of research and evaluation, functions can be pioneered by senior scientists and the project can pass through each department in turn. On the other hand, the approach can be by type or group of products or technology applied. The complete cycle from initial idea to first production batch is carried through by one department only.

In R&D organizations rigid hierarchical structures need to be avoided because such structure does not serve the end of science. Staff mobility has to be encouraged because it will help in bridging the gap between research and development and production. A sharp line of demarcation between various activities might hamper the working of the organization and the research in hand. In such organizations it is necessary that the scientists are transferred from one department to another to have the experience of each and every sphere of activity in the organization. It is always advisable to have less number of levels because when the number of levels in the hierarchical structure is greater, there is always possibility

of misunderstanding and misinterpretation of communication. To overcome this, it is necessary that the power should be delegated and the organization should function with decentralized authority. In such organizations it is always better to have an informal system although formal chain of command should also exist. In any formal group there always exists an informal group. It is better to formalize such groups so that they do not work as disruptive agents to the functioning of the administration.

The worker at the bench level should be of high competence or else the research project is doomed to failure. There is always a feeling in science institutions that from the top scientists to the scientists in the bottom of hierarchy have similar competence. Therefore, in R&D organizations hierarchy has to be least preferred while dealing with the scientific work and workers. It is necessary for the manager of a R&D group to develop necessary indices of measurement of technical competence of his staff. This can be done in the form of personal ratings

For competence work motivation of each scientist is the most important. It is necessary that the scientists should be provided with opportunities for growth and career planning.

Authority in R & D organizations should not be based on status difference. It should be shared by all the members of any work group. Scientists should be provided opportunities for participating in decisions affecting their own work. Scientists have to be managed through persuasion and not by direct or indirect domination (Rehman, 1972). Sometimes the financial controller in the organization operates as a committee of management. The auditor becomes an independent authority which undermines the capacity of the management to make decisions based on judgement. While the operating culture of the organization is based on the nature of the primary task and by the assumptions and behavioural norms of the people involved, the auditing authority have no patience for measuring the appropriateness of a decision (Sarabhai, 1974). Leadership in R&D organizations has three-fold tasks—leadership in the work; leadership in term-work; and leadership for professional management of organizations (Walters, 1965). It is perhaps easier for an individual to work as an individual and solve research problems in a group than to work with others and to provide leadership in team-work, and to manage research laboratories and organizations. One has to work with creative people. Such persons require freedom of imagination on the one hand, recognition and reward, on the other. They require a special kind of work environment. Sometimes their leisure-time activities contribute to valuable research ideas. Even flexible working hours help them at times in proper functioning as scientists.

With knowledge, workers' or professionals', decentralization is much better. Perhaps 'least management is best' with the scientists and technologists. Autonomy for knowledge workers is a basic requisite to effective working.

Like any work organization, R & D organizations should be viewed as social system because it "defines organizational problems in a way that increases our understanding of the interpersonal relations...Social system is ruled by principles of motivation, of learning, and so on" (Emery & Thorsud, 1974).

### RESEARCH NEED

The bureaucratic set-up in which our R & D organizations function today perhaps need change. This is evidenced by the fleeing of a large number of Indian scientists abroad. It may not be only due to higher wages that these people flee India but the way we run our science establishments makes it difficult to persuade them to continue here. The symptom of organizational ill health are very much there in R & D institutions.

Except for some impressionistic analysis and perhaps some attitude studies nothing has been done for understanding organizational dynamics of science institutions, laboratories, etc. In spite of the fact that a considerable part of our revenue is being invested in science the outcome is low. Our research scientists have not been able to make any impact on the science although we rank third in the world in numerical strength of scientists and technologists. Range Rao's (1972) estimate of individual productivity of Indian scientists at 1/3 of world average is alarming. Expenditure on R & D in India is much lower as compared with countries. In spite of large personnel, percentage of expenditure in GNP is much lower, which could be one of the reasons for lower productivity. Unless proper investment is made on each scientist employed, we can hardly expect productivity equal to the world average.

### *Organizational Development*

More important factor for the present state of science affair may be with the organizational set-up. How the science is administered? How our science laboratories are (mis) managed? No real answer has been provided by the seminars, reports and discussions. These discussions lead us to recommendations with all pious intentions and nationalist pretensions. They all blame hierarchy and bureaucracy. But do we really

have any alternative to bureaucracy? How do we make sure that with democratic set-up we shall not head for chaos? With all their (scientists) ego, in spite of the hierarchy and bureaucracy, there is enough chaos in our national laboratories. One can imagine what will happen if we have democracy.

Scientists may need autonomy. For management of creativity we have to build an organizational environment conducive to the growth of creativity. All this has to be done within the organizational set-up because no scientist today can afford to remain outside an organization.

Therefore, any attempt to improve creativity and manage science has to be based on social science knowledge of organizational behaviour. Much progress has already been made in organization development which tries to understand organization as living organism and which continuously helps the organizational growth. There is need to apply OD on research institutions.

### *Supervision*

One of the most intriguing problem with management of science would be the supervision and leadership in scientific laboratories. The science leadership has to be participative. The supervisor has not only to be a leader but also a talented scientist who can really help his juniors in their tasks and who can motivate them for productivity. There is need to find the appropriate style of leadership. There is also need to investigate the attitude of scientists towards supervision.

### *Motivation*

The most important problem of science management would be of motivation. Various theories of work motivation are not really adequate enough to explain work motivation of scientists (Agrawal, 1973). There is need to evolve a model suited to the needs of scientists. There is also need to develop a motivation model suited to leadership in science. Related problem here would be of cultivating team membership. There is need to find ways of developing team-spirit among scientists.

### *Personnel Policy*

The personnel policy related to the areas of grievance handling, selection procedures, promotion policy, wages and benefits, job evaluation, etc. are very important. There is need to conduct research in these areas

since the policies suited to general administration have not been found to be very conducive in scientific organizations

### *Creative Environment*

It would be imperative to find out the conditions for promoting creativity. These conditions relate to the individual scientist, his supervision, and the organization to which he belongs.

### *Social Psychological Factors*

There is need to find out the ways in which the scientist can be helped to grow professionally. What personality factors are responsible of creativity in science is the most important one. The role of values is important here. Age can also be an important factor to be investigated although age does not seem to affect the work and productivity of a scientist.

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# A Study of Relationship between Anxiety and Creative Thinking Ability

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*Anxiety is a powerful negative drive which compels an individual to exhibit maladaptive behaviour in various situations of life. Some people believe that creativity of a person can save him from the devastating effects of anxiety. On the other hand, there are people who feel that a person possessing creative thinking ability is not likely to fall a prey to anxiety. These conflicting views about the relationship of anxiety and creative thinking ability led the author to launch the present study. The sample of the study consisted of 220 (110 males + 110 females) teacher-trainees. A test comprising seven items was developed to measure creative thinking ability and Dutt Personality Inventory was used to measure anxiety in the sample population. The relationship between the two variables in the case of men and women trainees was ascertained separately as the two sex-groups differ significantly in terms of anxiety. In the case of men teacher-trainees, the relationship has been found to be curvilinear, whereas it is negative in the case of women teacher-trainees.*

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SOUND mental health is very essential for full functioning of an individual's personality. Anxiety is a powerful negative drive which compels him to exhibit maladaptive behaviour in various situations of life. Only a mentally healthy person can be expected to make his contribution towards the enrichment of his field of work. A mentally disturbed person will direct all his energies to come to terms with the situation which has



endangered his mental health. The energies which he might have utilized for moving higher along the continuum of effectiveness and efficiency, are now utilized for meeting the frustrations and disturbances of life. There are a number of people who believe that creativity or creative potential of a person can come to his rescue to face the onslaughts of anxiety on his mental health. On the other hand, there are many psychologists who earnestly believe that people with poor mental health cannot possess creative thinking ability. They advance the argument that such people would not have become mentally ill if they had possessed creative thinking ability. Thus, the exact relationship between creativity and anxiety needs to be determined and specified. Hence, the present study was launched to ascertain the extent and nature of relationship between these two variables.

#### TOOLS USED

##### (i) *Test of Creative Thinking (TCT)*

A test comprising seven items was developed on the pattern of Torrance Tests of creative thinking, to measure creative thinking ability in teacher trainees. The test was administered to 200 teacher-trainees for developing scoring guides. The scores on each item were correlated separately with the total scores to determine the suitability of each item. The minimum coefficient of correlation came out to be .49. The item-analysis was done by the method of upper and lower thirds and all the seven items stood the test of item-analysis. The split-half reliability coefficient of the test came out to be .84. The content validity of the test was assured by seeking the advice of a few well-known students of creativity-including Torrance. The predictive validity of the test was established by following the activities and attainments of those subjects who had secured high scores on the test.

##### (ii) *Test of Anxiety*

Dutt Personality Inventory (DPI) was selected to measure anxiety in the sample population. Its extensive use in master and doctoral studies has demonstrated its reliability and validity beyond doubt. With a view to know the consistency of the scores for the sample that provided data for the present study, the investigator computed odd-even reliability coefficient of the test which came out to be .81. ✓

*Collection of Data*

The two tests were administered to about 300 teacher-trainees studying in three colleges of education in Panjab. Since many of the items in the self-descriptive DPI contain negative effect, the investigator decided to place it after the CTT in the sequence of procedures to insure that there would be no adverse effect on the relaxed, game-like atmosphere which is essentially maintained for the administration of the test of creative thinking. As the two tests were administered on two different days, therefore, all the subjects could not take both the tests. Therefore, the investigator had to reduce the number of his sample for final analysis. He included 220 teacher-trainees (110 males + 110 females) in the final study.

*Statistical Analysis*

The data collected for the purpose of the present study were subjected to statistical analysis in the following manner :

(i) Frequency distributions for anxiety and CT scores were drawn. The two scores were found to be almost normally distributed in the sample population. The two measures of divergence (Skewness and Kurtosis) were found to be not significant and thus the basic assumption underlying various statistical treatments was fully satisfied.

(ii) The mean performance of men and women teacher-trainees was compared in order to ascertain whether the two groups come from the same population or not. Table 1 will make clear the standing of the two sex-groups on the two variables under study.

TABLE 1  
SEX DIFFERENCES IN MEANS OF ANXIETY AND CT SCORES

Variable	Men (N/110)		Women (N/110)		D Mean	SED	OR	P
	Mean	SD	Mean	SD				
Anxiety	29.95	18.60	42.86	21.50	12.91	2.71	4.76	< .01
CT	95.95	18.77	96.14	20.94	1.9	2.68	.07	N.S.

It is evident from Table 1 that men and women trainees do not come from the same population as far as anxiety is concerned. Therefore, it was decided to ascertain the relationship between creative thinking, and anxiety in the case of men and women trainees separately.

(iii) Product-moment coefficient of correlation ( $r$ ) is generally computed to establish relationship between two variables. But in the case of a curvilinear regression, a person ' $r$ ' is always less than its true value. Therefore, in order to ascertain the trend or nature of relationship between anxiety and creative thinking, anxiety scores were grouped into five larger intervals and the mean CT scores were computed separately for all the sub-groups. Table 2 provides an indication about the nature of relationship between the two variables.

TABLE 2  
MEANS AND SD'S OF CT SCORES OF FIVE ANXIETY SUB-GROUPS

<i>Anxiety</i> <i>Class Intervals</i>	<i>Men (N/110)</i>			<i>Women (N/110)</i>		
	<i>N</i>	<i>Mean</i>	<i>SD</i>	<i>N</i>	<i>Mean</i>	<i>SD</i>
81-100	1	67.00	—	3	82.00	9.57
61-80	7	89.50	21.38	22	84.95	16.73
41-60	18	96.17	17.62	37	98.15	21.58
21-40	47	98.01	15.71	23	100.37	22.63
1-20	37	95.18	18.92	25	99.10	13.90

It is clear from Table 3 that the mean CT scores in respect of the two samples begin to rise with the increase in anxiety scores but after the second interval they show a downward trend. The maximum performance on CT test is not that of the least anxious group. The 'middles' or the groups with modest anxiety tend to have maximum performance on CT test. It is quite evident that the drift or trend of the means of the sub-groups cannot be described by a straight line. On the other hand, it can be represented by a curve of some kind. So, the regression appears to be non-linear or curvilinear. But it needs confirmation by the application of some test of linearity.

In the light of suspected curvilinear relationship between anxiety and creative thinking, it was decided to employ correlation ratio (eta-coefficient) besides Pearson ' $r$ '. Moreover, it would facilitate application of the test of linearity to confirm finally whether relationship is linear or non-linear. The significance of the obtained  $\eta$ -coefficients was tested by the following formula :

$$F = \frac{E^2_{yx}}{1 - E^2_{yx}} \times \frac{N - K}{K - 1} \quad (\text{Walker and Lev, 1953})$$

where  $E^2_{yx}$  = correlation ratio for the regression of 'Y' on 'X'.

Pearson ' $r$ 's and the  $\eta$ -coefficients ( $\eta$ 's) between anxiety scores and CT scores in respect of the male sample and the female sample are given in Table 3.

'F' test (Guilford, 1956) was employed to test the linearity of regression of CT scores on anxiety scores. Table 4 depicts the computed 'F' in respect of the two samples.

TABLE 3  
PEARSON R'S AND ETA-COEFFICIENTS BETWEEN ANXIETY  
AND CT SCORES

Sample	df	r	p	(Eta)	F	df	p
Men	108	-.036	N.S	40	2.15	9+100	< .05
Women	108	-.18	< .06	32	1.13	10+99	N.S

TABLE 4  
F TEST FOR LINEARITY OF REGRESSION

Sample	f	df	p
Men	2.44	8+100	< .05
Women	.86	9+99	N.S.

Thus, it is evident that the regression of CT scores on anxiety scores in respect of the male sample is non-linear, whereas it is linear in the case of women teacher-trainees

### Conclusions

- In the case of men teacher-trainees, anxiety is curvilinearly related to creative thinking ability.
- In the case of women teacher-trainees, anxiety is negatively related to creative thinking ability.

### Discussion of Results

The present study has shown that in respect of the male sample, anxiety and creative thinking are curvilinearly related. This type of relationship suggests that CT scores increase with the increase in anxiety scores to a certain limit, thereafter, CT scores show a downward trend with the increase in anxiety scores. It is evident that up to the middle of the distribution of anxiety scores, the relationship between anxiety and creative thinking is positive, thereafter, it becomes negative.

These findings are in tune with the findings of Wallach and Kogan (1966), which are, according to them, suggestive of a curvilinear relationship between creativity and general anxiety or test anxiety. Those of high creativity are found to possess a middling degree of anxiety. Those whose creativity level is low, are loaded at one or the other extreme of anxiety. One is tempted by these results to point out the possible analogy with the Yerkes-Dodson law, in that creativity is minimal when the anxiety level is either too low or too high. Such a finding certainly does not support the idea that creativity flourishes best under completely anxiety free conditions. Thus, absence of anxiety in a male student-teacher is no guarantee for the 'robust' functioning of higher mental abilities. Moderate or normal anxiety appears to be an essential prerequisite for optimum functioning of creative potential.

In the case of women trainees, Pearson 'r' has proved to be the most appropriate measure of relationship because the relationship between creativity and anxiety has not proved to be nonlinear. The computed 'r' makes it clear that in the case of female sample, creative thinking is inversely related to anxiety. This interesting phenomenon can be attributed to the fact that in the case of most of the women, moderate anxiety is the minimum level of anxiety. Their performance on CTT is maximum at the modest level of anxiety but any further increase in the anxiety score is accompanied by a corresponding decrease in the CTT score. Thus, it can be concluded that in the case of women student-teachers, creativity is negatively related to anxiety.

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# Development and Standardization of a Teacher Attitude Inventory

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*The Teacher Attitude Inventory (TAI) is a tool that attempts to measure professional attitudes of prospective and practising teachers. It follows the Likert's technique of attitude scale construction.*

*The try-out sample and the standardization (norming) sample consist of 1,402 and 2,169 B Ed. student-teachers of 15 and 21 training colleges, respectively, of the five Hindi speaking States of Uttar Pradesh, Madhya Pradesh, Haryana, Rajasthan and Bihar selected on the basis of a random sampling.*

*The TAI is a reliable and valid tool for measuring teacher attitudes towards teaching profession, classroom teaching, child-centred practices, educational process, pupils and teachers.*

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THE quantitative expansion and qualitative improvement of secondary education has raised problems of selection of right type of teachers and enriching programmes of teacher-preparation. This necessitates not only improving the knowledge and teaching competence of a teacher but also to inculcate in him healthy attitudes and desirable qualities.

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The persons interested in using the TAI for research should write to the author for advice and permission.

Teacher-training institutions have initiated, perhaps half-heartedly, some schemes for stirring and stimulating the student-teachers who enter their portals for receiving professional training. It is a good augury that educationists and educational planners all over the country have started realizing that only securing enough teachers will not do; as what is equally important is securing the right type of teachers. Unless such teachers are found, the secondary schools cannot deliver the goods that are expected of them. Fundamentally, the success of secondary education does not depend either on the definition of aims, statement of objectives, or discussion of subject values but on the academic and professional preparation of teachers.

For the professional preparation of teachers the study of attitude held by them is very important. How a teacher performs his duty as a teacher is dependent, to a great extent, on his attitudes, values and beliefs. A positive favourable attitude makes the work not only easier but also more satisfying. A negative unfavourable attitude makes the teaching task harder, more tedious and unpleasant.

In addition, a teacher's attitude not only affects his behaviour in the classroom but also influences the behaviour of his students. Moreover, effective and productive learning on the part of pupils can be achieved by employing teachers with desirable attitudes or by shaping their attitudes in the desired direction.

Hence, it appears relevant to develop a dependable multi-dimensional attitude inventory for measuring attitude of prospective teachers towards: (i) teaching profession, (ii) classroom teaching, (iii) child-centred practices, (iv) educational process, (v) pupils, and (vi) teachers. Such a tool, if developed, can be useful at a later stage in making a systematic and scientific investigation into the effect of teacher education programmes on the attitude of student-teacher's training institutions, in any part of the country. Thus the proposed inventory, it is believed, will be a worthwhile tool for the training institutions not only for diagnostic and prognostic purposes but also for the possibility of its use in changing the attitudes of the teachers through a positive programme of inculcating favourable attitudes in the teacher-trainees by changing the organizational climate of training institutions and by enriching the social and emotional climate of their classrooms.

### *Construction of the Teacher Attitude Inventory*

Attitude has been defined differently by different people. The present study accepts the term "attitude" as an enduring system of positive

or negative evaluation, emotional feelings, pro and con action tendencies with respect to a social object. In the present context, as applied to the investigation in hand, it is an enduring system of favourable or unfavourable evaluations, feelings and action tendencies with respect to the teaching profession and allied areas.

Among the different techniques available for the construction of attitude scale, the more popularly used techniques are . (a) the method of equal-appearing intervals known as the "Thurstone Technique" and (b) the method of summated ratings, also known as Likert Technique. These methods have been widely used in India and abroad.

Likert Method was thought to be more suitable for use in the construction of the TAI. The construction of the TAI has undergone through the following steps :

(i) Collecting a large number of statements on the professional attitudes or objects of professional significance and importance, viz teaching profession, classroom teaching, child-centred practices, educational process, pupils, and teachers from diverse sources such as related literature, attitude scales and inventories, opinion of educationists, experts and such other groups of persons.

(ii) Editing of items . The editing process is important for Likert scales for objective check on the ambiguity of the statements. The criteria suggested by Edwards (1969) were adhered to in editing the items. Out of the initial collection of 300 items 150 items were retained of which 92 were positive and 58 negative.

### *Try-Out*

The TAI was developed as a bilingual attitude scale. Items were prepared in the form of attitude statements both in English and Hindi. Each respondent was asked to give his preference in the form of : strongly agree, agree, undecided, disagree, strongly disagree by tick-marking (✓) in the square space provided in the answer-sheet against each item.

The preliminary form of the inventory was administered to 1,402 B.Ed. students of 15 training colleges—three training institutions from each of the five Hindi-speaking States of Haryana, Uttar Pradesh, Madhya Pradesh, Rajasthan and Bihar—for the try-out, studying in the year 1971-72 and 1972-73.



TABLE 1  
INFORMATION ABOUT THE TRY-OUT SAMPLE

<i>S No.</i>	<i>Name of State</i>	<i>No. of Colleges</i>	<i>No of Subjects</i>
1	Uttar Pradesh	3	260
2.	Madhya Pradesh	3	294
3	Bihar	3	308
4	Haryana	3	248
5.	Rajasthan	3	292
Total		15	1,402

Each item-alternative is assigned a weight from 4 (strongly agree) to 0 (strongly disagree) for favourable items. In the case of unfavourable items the range of weight is reversed, i.e from 0 (strongly agree) to 4 (strongly disagree). The attitude score of a subject is the sum total of item scores of all the six sub-scales, thus higher score indicating the more favourable attitude towards teaching.

#### *Item-Analysis*

The answer-sheets were scored and arranged in descending order according to total scores. Afterwards, item-analysis was conducted to identify the discriminatory power of the items. The upper 27% of cases and the lower 27% cases were taken to find out the *t*-value of each attitude statement. Those 90 items, 15 items on each sub-scales, which have a *t*-value of 1.75 or greater than it, were retained to constitute the final form of the inventory. An attempt was made to retain equal number of favourable-unfavourable, positive-negative items in each sub-scale of the TAI.

#### *TAI - Its Final Form*

The TAI is a self-reporting inventory consisting of six sub-scales designed to measure the attitude of student-teachers towards teaching profession, classroom teaching, educational process, child-centred practices, pupils, and teachers developed on Likert, i.e. method of summated ratings. The complete set of the TAI consists of a re-usable test booklet, an answer-sheet a set of six scoring keys and the manual. The inventory is bilingual (Hindi and English) provided in one single booklet.

The inventory as a whole has 90 items, 15 in each sub-scale. It has favourable-unfavourable as well as positive-negative items numbering 43-47 and 56-34, respectively. Each item has five alternatives ranging from 'strongly disagree' to 'strongly agree'. For favourable items the 'strongly agree' response was given the highest score of 4, the 'agree' response a score of 3, the 'undecided' response a score of 2, the 'disagree' response a score of 1 and the 'strongly disagree' response a score of zero. For unfavourable items, the scoring reversed with the strongly disagree response, was given the score of 4 and the strongly agree response the score of zero. For each subject a total score on each sub-scale was obtained by summing his scores for the individual items. The instructions for administering the inventory and scoring the responses have been given in the manual. There is no time limit, but normally it takes 25-30 minutes to complete the TAI and less than 10 minutes to score each answer-sheet.

The inventory has been standardized on a group of 2,145 B.Ed. student-teachers of 21 training colleges of the five Hindi-speaking states of Haryana, Uttar Pradesh, Madhya Pradesh, Rajasthan and Bihar, studying in the academic year 1972-73 and 1973-74.

TABLE 2  
INFORMATION ABOUT NORMING POPULATION

<i>S No.</i>	<i>Name of State</i>	<i>No. of Colleges</i>	<i>No of Prospective Teachers</i>
1.	Uttar Pradesh	6	691
2	Madhya Pradesh	5	433
3.	Bihar	3	435
4	Haryana	4	318
5.	Rajasthan	3	292
Total		21	2,109

The reliability of the inventory was estimated by split-half method and was found to be ( $r=0.79$ ) quite satisfactory.

The test-retests' reliability coefficients after the interval of 3 and 9 months are found to be ( $r=0.58$  and  $r=0.64$ ) reasonably high. This established that the inventory (TAI) is a reliable tool for measuring the attitude of prospective and practising teachers towards teaching profession, classroom teaching, child-centred practices, educational process, pupils and teachers. The reliability coefficients, indices of reliability, etc. are given in Table 3.

TABLE 3

RELIABILITY COEFFICIENTS, INDICES OF RELIABILITY,  
CORRECTED COEFFICIENTS AND STANDARD ERRORS OF  
MEASUREMENT

S No	Method	Reliability coefficient		Index of reliability  r100	Standard error of measurement  SE Mes.
		obtained  r	corrected  r		
1	Split half (odd even)	0.79	0.88	0.89	11.37
2	Test-retest (3 months)	0.58	0.75	0.76	16.17
3	Test-retest (9 months)	0.64	0.78	0.80	15.16
4	Rational Equivalence (KR 21)	0.54	0.70	0.73	20.10

The inventory appears to have content validity and the method of selecting items supports this supposition. In addition, differences in mean scores were found among selected "stimulus" and "known" groups. Comparable scores for B. A. Part I and Part II students offering and not offering Education as an elective subject, B.Ed trainees and practising teachers of ordinary and Catholic schools were collected and studied critically. They were found to be in the anticipated direction of increasing magnitude. Table 4 presents at a glance a summary of the analysed data. Without any ambiguity these differences were in the expected direction.

The high discriminatory power of the items is a testimony to its internal consistency. An appraisal of item validity has been made and it has shown satisfactory results. No study regarding the invalidating influences of social desirability under normal or ideal research conditions has been conducted.

The six sub-scales of the TAI control somewhat for acquiescence-response set by including an equal or approximately equal number of favourably and unfavourably worded statements. Convergent validity studies that is research correlating scores from the instrument in question with scores from other instruments (such as the Hindi Adaptation of the Minnesota Teacher Attitude Inventory, i.e. MTAI) also purporting to measure teacher attitudes give satisfactory correlation coefficients. Table 5 presents at a glance a description of the relevant data.

## TEACHER ATTITUDE INVENTORY

TABLE 4  
MEAN, STANDARD DEVIATION AND OTHER MEASURES OF SOME  
SELECTED GROUPS

<i>S No.</i>	<i>Group</i>	<i>N</i>	<i>M</i>	<i>SE<sub>M</sub></i>	<i>SD</i>	<i>SE<sub>SD</sub></i>
1	B A. Part I (not offering education elective)	56	230.53	2.04	21.98	2.09
2.	B. A. Part II (not offering education elective)	53	230.73	3.44	28.74	2.44
3	B A. Part I (offer- ing education elective)	70	237.98	3.41	23.36	2.41
4.	B A Part II (offer- ing education elective)	47	252.91	4.65	33.91	3.30
5	Practising Teachers	122	251.41	2.78	30.70	1.97
6.	Prospective Teachers (at the time of B. Ed admission)	76	236.88	4.36	38.02	3.09
7	Prospective Teachers (After 9 months of B. Ed training)	76	247.45	3.63	31.65	2.46

TABLE 5  
CORRELATION BETWEEN SCORES ON TAI AND SCORES ON HINDI  
ADAPTATION OF MTAI (N=79)

<i>S. No.</i>	<i>Variables</i>	<i>Correlation Coefficients</i>
1.	MTAI scores and scores on Factor I of TAI	+0.52
2.	MTAI scores and scores on Factor II of TAI	+0.32
3.	MTAI scores and scores on Factor III of TAI	+0.02
4	MTAI scores and scores on Factor IV of TAI	+0.27
5	MTAI scores and scores on Factor V of TAI	+0.23
6.	MTAI scores and scores on Factor VI of TAI	+0.07
7.	MTAI scores and TAI scores	+0.23

*Usefulness*

The TAI appears to have reasonably high reliability (Table 3) and validity (Tables 4 and 5) As such it is a dependable inventory for measuring attitude towards teaching profession, classroom teaching, child-centred practices, educational process, pupils and teachers.

It appears to be useful for conducting research in the following areas :

- (1) measuring the effectiveness, mainly in the area o' attitude development, of teacher preparation/education programmes in India,
- (2) knowing whether student-teachers have acquired the desired attitude,
- (3) assessing the quality, in respect of attitude development, of secondary teacher-training college programmes;
- (4) comparing the performance of different training institutions in the area of attitude development,
- (5) comparing the attitudes of different groups of prospective and practising teachers on the six selected sub-areas of teaching profession/process;
- (6) using a tool for conducting interdisciplinary cross-cultural and transitional research in the field of attitudes of prospective and practising teachers, and
- (7) constructing newer and more dependable tools in the difficult area of attitude appraisal and assessment.

In addition to the above studies, which are relevant to construct validity because they test theoretical predictions need be conducted in the future. Such studies will help in the refinement of the Teacher Attitude Inventory.

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# Relationship between Extroversion-Introversion, Neuroticism and Academic Achievement

## Experience of the Army Educational Corps

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*The present study aims at finding out the relationship between extroversion-introversion and neuroticism and academic achievement in respect of Army Educational Corps personnel. Different findings in the field point out that the people having a high neurotic score are fairly good in academic achievement but higher level of neuroticism inhibits academic achievement.*

*The study was conducted on 190 personnel of Army Educational Corps consisting of 70 non commissioned officers (NCOs), 70 junior commissioned officers (JCOs) and 50 commissioned officers (Officers) at Army Educational Corps Training College Centre, Pachmarh, M.P.*

*It has been found by the investigator that there exists a substantial negative correlation between academic achievement and neuroticism factor in respect of Army Educational Corps personnel. The correlation between academic achievement and extroversion factor is also negative and substantial in respect of NCOs and commissioned officers. However, it is positive in respect of JCOs. Age does not have any relationship with N and E factors*

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WHENEVER a teacher enters a classroom, he discerns a number of individual differences among the students. The difference might be in body-build, temperament, the level of achievement, level of intelligence, socio-economic background and so on. Each personality is a unique and yet a common strain of similarity flows throughout the class. Some of the experts in the field are of the opinion that some of the personality dimensions are mainly a function of environment and others of heredity. A given personality pattern varies depending whether the focus is upon differences between families or within the families. The characteristic individual differences in behaviour of men are attributed to inherited determinants though this is not acceptable to many. The personality traits of extroversion-introversion and neuroticism are distributed in more or less degree in a given population. So variant are the human personality traits that no two men are alike. An instructor putting the same effort in a classroom achieves different results, even though the class be composed of a homogeneous group. The pattern of achievement might depend on the extroversion-introversion or neuroticism factor present in the student's personality. Different findings point out that the people having a high neurotic score are fairly good in academic achievement but higher level of neuroticism inhibits academic achievement.

### *Objectives*

The main objective of the present investigation is to study the relationship between extroversion-introversion and neuroticism and academic achievement in respect of Army Educational Corps personnel of Army Educational Corps Training College and Centre, Pachmarhi, M.P. Some other secondary objectives of the study are :

- (a) To investigate whether there exists any relationship between extroversion-introversion and neuroticism and rank structure, i.e. commissioned officers, JCOs and NCOs.
- (b) To investigate if there exists any relationship between extroversion-introversion and neuroticism and age.

### *Sample*

The present study was conducted at the Army Educational Corps Training College and Centre, Pachmarhi, M.P. One hundred and ninety personnel of Army Educational Corps consisting of 70 Non-Commissioned Officers, 70 Junior Commissioned Officers and 50 Commissioned Officers were selected randomly as a sample.

*Instruments Used for the Collection of Data*

The long scale Hindi version of Maudsley Personality Inventory (MPI) prepared by Jalota was used for the collection of relevant data.

*Collection of Data*

For the collection of data the investigator approached the subjects personally. A conducive atmosphere was created for the filling of MPI questionnaire so that the subjects may give out their real self. The subjects used to be seated comfortably and were asked to read the instructions carefully. The investigator read out the items aloud and at times explained the literary meaning of difficult words or sentences. The subjects were assured that the inventory seeks their pattern of behaviour only and does not concern with intelligence, efficiency or aptitude. They were told not to ponder on any question and to give a first-hand immediate response. The secrecy of information was obvious as there were no names to be endorsed on the inventory

*Treatment of Data*

After obtaining the necessary data through the MPI it was put to statistical treatment. A scatter diagram was prepared and the Pearson's Product Moment Coefficient of correlation was computed. Inter-correlations between different strata were computed and their significances were also tested. The data has been analysed separately for commissioned officers, junior commissioned officers and non-commissioned officers. The dimension of neuroticism and extroversion-introversion was compared both with their academic achievement and age.

TABLE 1  
COMPARISON OF ACADEMIC ACHIEVEMENT WITH  
N AND E DIMENSIONS OF PERSONALITY  
( $N=190$ )

<i>Personnel Category wise</i>	<i>Mean</i>		<i>SD</i>		<i>r</i>		<i>N</i>
	<i>N</i>	<i>E</i>	<i>N</i>	<i>E</i>	<i>N</i>	<i>E</i>	
(a) Non-Commissioned Officers	19.07	29.4	9.05	6.85	-.12	-.08	70
(b) Junior Commissioned Officers	19.43	29.5	9.95	6.05	-.12	+.18	70
(c) Commissioned Officers.	17.5	28.3	8.00	6.10	-.11	-.16	50



TABLE 2  
COMPARISON OF AGE WITH N AND E  
DIMENSIONS OF PERSONALITY  
( $N=190$ )

<i>Personnel Category-wise</i>	<i>N</i>	<i>Mean</i>		<i>SD</i>		<i>r</i>	
		<i>N</i>	<i>E</i>	<i>N</i>	<i>E</i>	<i>N</i>	<i>E</i>
(a) Non-Commissioned Officers	70	19.07	29.4	9.05	6.90	.04	.02
(b) Junior Commissioned Officers	70	19.1	29.5	9.05	5.85	-.12	-.07
(c) Commissioned Officers	50	13.7	28.3	7.40	6.10	-.15	-.07

TABLE 3  
SIGNIFICANCE OF DIFFERENCE BETWEEN  
'rS', AGE AND N-E FACTORS

<i>Category</i>	<i>E (OR)</i>	<i>Significant at .05 level Yes</i>	<i>N (OR)</i>	<i>Significant at .05 level No</i>
Non-Commissioned Officers and Junior Commissioned Officers	.5	No	.92	No
Junior-Commissioned Officers and Commissioned Officers	.75	No	.2	No
Non-Commissioned Officers and Commissioned Officers	.5	No	1.02	No

## FINDINGS

The significant findings of the present investigation may be summarized as follows.

*Non-Commissioned Officers (NCOs)*

(a) The non-commissioned officers exhibit a substantial negative relationship between academic achievement and neuroticism ( $r=-.12$ ).

(b) There exists a very low negative correlation amongst the non-commissioned officers with regard to academic achievements and extroversion dimension of personality ( $r=-.08$ ).

(c) Correlation between age and neuroticism score in respect of non-commissioned officers is also low which is not at all significant.

(d) Correlation between age and extroversion factor of personality is low which is also insignificant ( $r=0.04$ )

#### *Junior Commissioned Officers (JCOs)*

(a) A significant negative relationship has been found between academic achievement and neuroticism in respect of junior commissioned officers ( $r=-0.12$ ).

(b) It has also been found that there exists a positive correlation between academic achievement and extroversion dimension of personality in respect of junior commissioned officers ( $r=0.18$ ). This indicates to a very little extent that extrovert junior commissioned officers have positive inclination towards academic achievement.

(c) There exists a negative correlation between age and neuroticism amongst the junior commissioned officers ( $r=-0.12$ ).

(d) It has also been found that there exists a negligible relationship between NE scores and age of the junior commissioned officers.

#### *Officers*

(a) It has been found in the present investigation that there exists a low negative relationship between academic achievement and neuroticism in respect of commissioned officers ( $r=-0.11$ ).

(b) Also there exists a negative and low correlation between academic achievement and extroversion ( $r=-0.16$ ).

(c) Correlation between age and neuroticism is also low negative which is insignificant ( $r=-0.15$ ).

(d) It has also been found that age and extroversion has no relationship as far as commissioned officers are concerned.

#### *Conclusion*

Generally speaking, there exists a substantial negative correlation between academic achievement and neuroticism factor in respect of Army Educational Corps personnel.

The correlation between academic achievement and extroversion factor is also negative and substantial in respect of NCOs and commissioned officers. However, it is positive in respect of JCOs. Age does not have any relationship with N and E factors.

#### *Implications for Education*

A number of educational implications emanate from the foregoing findings.

(a) Academic achievement of a student to a certain degree, is dovetailed with a typology of personality trait of neuroticism. The personnel with optimum neuroticism score can be singled out for specific and purposive instruction. When such cases are brought on a roster, it will be easy for educational authorities to employ reoriented techniques and intensify training in various subjects successfully, specially in case of army educational personnel who come on various courses conducted at Army Educational Corps Training College and Centre or further studies in the same course.

(b) The extroverts normally have low cortical arousal and greater inhibition in the cortex of the brain. Since majority of the population are extrovert, the authorities may arrange for specific audio-visual aids to captivate attention of students and remove inhibition.

(c) The score on NE dimension may help to predict academic achievement.

(d) With the help of MPI or perhaps the suitable substitute personnel can be selected for higher studies either at graduate or postgraduate level.

(e) New entrants at the college as well as at university level could be classified on the basis of scores obtained on MPI with special reference to new entrants in the Army Educational Corps. This will enable the authorities to apportion a special environmental treatment or a specified dose of educational intake.

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# Psychological Barriers to Work Commitment

## A Diagnostic Study

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WORK COMMITMENT refers to an inner urge of willing acceptance by an employee of some work which has been assigned to him by his employer or immediate superior.

Psychological barriers to work commitment emanate from several socio-personal and technical variables within or outside an organization or institution. These barriers differ in degree according to the level of the employee (viz., worker, clerk, supervisor, junior or senior officer/manager) and his personality factors. These can be briefly discussed in the following categories.

### *(a) Unsuitability to a Job*

Unsuitability to a job refers to one's intelligence, aptitude, interests and achievements apart from mental health factors, personality traits and outside social environments which are directly or indirectly concerned with the work assigned to the employee. Generally, unfits, misfits, neurotics, authoritarian or short-tempered employees can be enumerated in this category.

### *(b) Inconsistency between the Employee's Needs and Organizational Goals*

Inconsistency between the employee's needs and organizational goals gives rise to inner conflict leading to apathy, disloyalty, frustration and tension in a suppressed form. It creates fear for new task, develops

uncertainty and insecurity, lowers his work efficiency and makes his work more uninteresting. In the event of such apathy and indifference continuing over a long period, a vicious atmosphere of a poor group-morale emerges, very harmful to the personal and organizational development. The employee either quits the organization under desperation or turns into a problem-employee for the employer in due course.

(c) *Insufficient Incentives*

Incentives, financial or non-financial, can be categorized into affiliation motive, competence motive, achievement motive and economy motive. Each employee is differently influenced according to the hierarchy of one's needs and satisfaction of actual or ego-motives. In other words, no two individuals have similar, impact of any one type of incentive. The immediate superior must take the feeler and recognize the incentives which attract different employees according to their needs so as to avert dissatisfaction and lack of enthusiasm among them in their assigned work. For instance, adequate income and sympathetic behaviour may influence the lowest-level employees, congenial work-group and opportunity for developmental training may prove attractive to middle-level officers/managers, and promotion and competitive behaviour may encourage the top-level officers/executives.

WORK COMPONENTS THAT DO NOT CORRELATE  
WITH THE EMPLOYEE'S NEEDS

Work components refer to the nature of a job, money that it fetches and the working environment it involves.

(a) *Nature of Work*

Generally, monotonous, unpleasant, repetitive, temporary and non-challenging types of jobs create psychological barriers to work commitment among those, who are above-average in intelligence, achievement motivation and related aptitudes. The degree of automation a job involves, the design of machines it bears and the related instruments or equipment one is supplied with, may be attributed, singly or collectively, to the dissatisfying variables. If a job inherently involves abrupt changes; particularly those which are unfavourable, major or/and incongruent, the employee will most probably be developing in himself a tendency to resistance. On the contrary, an above-average employee enjoys and prefers work, challenging in nature, which requires exercise of his discretions and judgements.

(b) *Uncompetitive Salary Compared to Other Similar Jobs*

Money procures tangible things. It is a symbol of success, recognition and esteem in one's society. The monthly salary packet which one carries is a barometer of one's purchasing power, capacity to enjoy the material life. It converts one's comforts and/or luxuries into necessities. Each one of us, to some extent, is a victim of "comparative complex" and hence continues comparing one's job and allied salary with those of others around us within or outside the organization.

(c) *Unpleasant Working Conditions and Surroundings*

Unsuitable work-place or shabby atmosphere around an employee slackens his work efficiency on account of psychological unpleasantness.

INCOMPETENT AND COLD SUPERVISION

The supervisory aspects of inter-personal relationship of a senior towards his subordinates make substantial difference in the work-efficiency of the subordinates directly or indirectly. Again, if a superior belongs to the authoritarian type of personality, he is generally power-crazy, likely to prefer non-participative system of decision-making and emphasizes too much on work and too close or frequent supervision over his subordinates. He is apt to be self-centred rather than group-centred and enjoys in driving than leading his subordinates. Moreover, the incompetence of a boss corrodes trust and freedom of the worker and this involves ineffective communication such as, job-instructions, maintenance of discipline, reprimanding, handling of grievances, acceptance of suggestion, etc.

UNCONGENIAL WORK-GROUP

The *esprit de corps* is spoiled because of the lack of cohesiveness, unmanageable size of the work-group and the competitive characteristics within, apart from the out-group feelings, such as, mutual distrust, unhealthy criticism, cliques, etc. Again, any difference due to caste or socio-cultural background may influence an individual employee and therefore his work-efficiency is bound to be affected accordingly in the event of any adverse situation.

POOR ADMINISTRATION AND LACK OF UNIFORM POLICY

Poor administration, among other factors, does account for the lack of proper merit-rating system, insufficient welfare and safety measures,

want of necessary participation in the major policies of the organization, favouritism in promotion, and unreasonable salary and fringe benefits. Lack of uniform policy in administration and management, on the one hand, gives rise to various sorts of pulls and pressures, and on the other, develops a vicious circle of showing or giving favours and benefits on a few without caring for their merits and demerits. Such an executive or officer is labelled as ego-centred, unbalanced, power-crazy, and double-dealer. He looks favourably to those who can dramatically and lavishly flatter him and discounts others who cannot do so. The majority holds about him conflicting views in public compared to those in private and hence he can hardly earn respect from those who have "worth" in the real sense rather than mere authority entailed by position one holds.

To sum up, the psychological barriers to work-commitment depends upon various personal, social, environmental and technical factors, which, if ignored, do not give optimum corresponding results. And, hence, no superior should expect optimum efficiency from his subordinate (s) in view of the above psychological barriers to work-commitment, otherwise he will face sheer disappointment, greater confusions and distorted self-image. □

# Rapid Reading

## A Necessity of Modern Times

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READING IS COMMUNICATION. The term 'communication' indicates that reading involves much more than the mere ability to pronounce or recognize the words printed on the page. The purpose of all communication is the sharing of meanings. When a speaker says something to the listener which he is not able to understand, communication has not taken place. Similarly, when a writer writes something which the reader is not able to understand, reading in a real sense has not taken place. It is the symbol that must carry the burden of meaning between the communicators. The symbol—written or spoken—is the writer's or speaker's tool for creating meaning in the mind of the reader or listener.

### *The Concept of Reading*

Reading means many things to many people. To a psychologist, reading is a thought process. The semanticist is concerned with the meaning and considers the printed page to be the graphic representation of speech. The linguist concerns himself with the relationships between the sounds of a language and its written forms. The sociologist studies the interaction of reading and culture; and the litterateur reacts to the artistic nature of the material before him. The educationist is interested in reading as a visual and mental phenomenon. As a visual phenomenon,



it helps in the identification of sound symbols and as a mental phenomenon, it serves as an agent to the association of meanings

### *What Happens When a Person Reads ?*

The reader perceives the words, comprehends their meanings, reacts to them and assimilates them. Perceiving the words is just a mechanical process but comprehension involves mental processes. How the mind works in the reading process ? Here comes the difficult task of cognitive psychology. Whether an element of a system can study itself successfully, whether a man can describe his own mind in an intellectually useful way is really uncertain and involves complexities. Huey had once remarked: "To completely analyze what we do when we read would almost be the acme of a psychologist's achievements, for it would be to describe very many of the most intricate workings of the human mind, as well as to unravel the tangled story of the most remarkable specific performance that civilization has learned in all its history." Reading is one of the most complex operations of the human mind.

### *Measurement of Eye Movements*

Almost a century ago, people used to think that a reader perceives words, letter by letter. The whole methodology of teaching beginning-reading was based on the assumption that a person looks at each separate letter as he reads. Even up to this day we teach our children in schools beginning with isolated alphabets

It was only in the year 1879 when Professor Javal of Paris University became interested in studying the eye movements. To begin with, he tried to observe the eyes of the people who were reading by just looking at them with his own naked eyes. As the eyes of the readers moved very fleetingly, Javal could not tell what took place. Javal did not get discouraged. He again tried placing a mirror in front of the reader, watching the reader's eye in the mirror. But this also did not work. He thought of taking help from his friends but all in vain. No one realized his difficulty to invent some way of checking the eye movements of a person engaged in reading. "Nonsense", they said. "Why bother about something that everybody already knows ? The eyes have to look at each letter in every word as they move across a line of print. Otherwise, how could the reader tell one word from another ?" Javal, however, doubted that a person recognized printed sentences letter by letter, so he kept busy in figuring out some method by which he could detect the way in which the human eye works when one reads.

Javal fashioned a cup of plaster of paris which was to fit over the eye-ball of the person reading. He also made a small hole (an aperture) in the middle of the cup through which the reading material could be seen. While the plaster of paris was still damp and pliable, Javal inserted a very thin and light stick into the outer side of the cup. When the cup dried, the stick was securely rooted in the plaster of paris. He also smoked a drumhead. The smoke left a heavy black coating on the drumhead. When the plaster of paris cup with a stick and the smoked drumhead were ready, Javal asked a man to sit close to the drumhead and read. The plaster of paris cup was placed over one eye of the man and as he read, the stick traced a design in the smoke coating on the drumhead. This design revealed that the eyes did not look at one letter at a time or even at one word at a time. Rather, they proceeded in a series of pauses and jerks, stopping only three or four times in covering an entire line.

A few years later, Ahrens (1891) and Huey (1906) improved upon the plaster of paris cup in that they used an ivory cup to which they attached a bristle. The bristle recorded the eye movements on a smoked drumhead. Other investigators began to make studies of their own using different kinds of equipment. Finally, a huge camera was designed by a professor who devoted a year's time to its perfection and it cost 6,000 dollars.

### *Emergence of a New Methodology in Rapid Reading*

Once a scientific procedure for detecting eye movements was developed, hundreds of studies were made with all kinds of readers at various age levels showing decided differences between the way poor readers read and the way good readers pursue the printed page. These studies revealed that the poor reader perceives just one word or perhaps a part of word while a good reader takes in a group of words at one seeing. It is evident and researches in the area have proved that the person who takes in an entire group of words at one seeing can read more rapidly than one whose eyes are fixed on one word at a time or perhaps on parts of words. From this concept emerged a new methodology in rapid reading.

### *Early Studies on Rate of Reading*

Quantz tested fifty students—juniors and seniors—of the University of Wisconsin, to determine their normal and maximum rates in reading, and experimented upon them further to determine the factors and conditions upon which rate of reading depended. He found that his readers varied from 3.5 words per second for the slowest to 8.8 words per second for the

fastest, when reading at normal speed. At maximum speed the rate ranged from 3.5 words per second to 12.2 words. Generally, those who read fast at normal speed excelled in the maximal tests, and the slow readers were generally slow in both. In testing the ability to reproduce what was read, he found that the rapid readers were on an average about 37 per cent superior to the slow readers in the quality of their work. The superiority of the rapid reader is also shown by the fact that his memory of the substance of his reading is more exact than that of the slow reader.

Dearborn tested the reading rate of a considerable number of readers, and found that for a given class of reading matter the fastest reader read more than three times as fast as the slowest. He also carefully tested the reading rates of three graduate students, one a mathematician, one a teacher in a secondary school, and one a psychologist, for various classes of reading matter selected from literature and science. Each of these persons had quite different rates for the different kinds of matter read. However, the fastest reader in his most interesting subject, in this case the mathematician, read much the faster in all the classes of matter, the secondary teacher read all kinds of reading material much more slowly than the mathematician, and the psychologist read much more still in all but one class. Dearborn draws from this data the conclusion "that one who reads rapidly in a given style and class of subject-matter will read somewhat proportionally faster than a slow reader, whatever, within certain recognized limits, the nature of the style and subject-matter."

### *Why Read Rapidly ?*

The dependence of man upon interchange of thoughts and opinions through the medium of printed lines is immeasurable. To imagine a day without reading is impossible. Reading enters into nearly every phase of life. Moreover, it has unique contributions to make. Reading is an avenue of learning—a tool, a means to an end. Initially, we learn to read, but thereafter, we read to learn. Reading is important for the leisure of life, no less than for the work of life. It contributes to personal as well as to professional growth. It helps to make the life richer and more meaningful. Reading is a form of experience through which horizons may be expanded and this leads to personality development.

Rapid reading habits enable a person to get more in comparatively less time, which is the demand of the hour. We are living a very busy life and hardly find any time to keep ourselves fully informed with what is going on around us. The possession of rapid reading ability comes to our rescue in our busy schedule. It helps us in enriching our life with plenty of materials from different areas, becoming more efficient in our professional undertakings and rendering greater service to the mankind.

Have you ever thought how much of your waking hours is devoted to the printed symbols? Almost all the professions require much reading during the period of preparation, as well as continued reading while in a profession if one is to keep pace with the new developments. Too often people do not realize the value of reading. After they have obtained their degrees and entered into their professions, they do not pursue any systematic course of professional reading because they consider it a great strain and burden on them. Unless they become life-time readers and derive pleasure out of reading, reading will always be a tiring and monotonous activity for them.

Many students at collegiate and university level and adults engaged in a variety of undertakings in business and industry are much slower readers than they need to be. They read everything so slowly as if all the time they were reading legal documents. Their slowness is mainly due to their non-flexible approach to the range of reading materials which they encounter. They are very rigid in their approach to reading and never think of using different reading speeds according to the reading purpose and occasion. These inflexible readers are like inefficient drivers who always use the same uniform speed without taking into account the traffic or road conditions. They, perhaps, are not aware that not every bit of reading material requires a slow and steady approach.

A slow reader cannot keep pace with the latest knowledge. He will have to cut a sorry figure when his reading speed is very slow and he has to read a lot in comparatively lesser time. A rapid reader is always at an advantageous position. We do not always expect that a person should read at a fantastic speed but we will have to admit this fact that once a person inculcates in himself the habits of rapid reading, he is always benefited. Whenever the occasion demands, he goes very fast but the moment he feels the need to slow down, he immediately changes his speed and slows down. A rapid reader in the sense of an efficient reader is a flexible reader who very well knows to move fast but can slow down according to requirements. He is like an efficient driver. Both are good at changing gears.

We heard nothing about rapid reading when most of us were in schools. At that time we had less number of books and plenty of spare time. But now we are reaching a juncture where we must say: 'books are in abundance, we have to read a lot, we want to read but where is the time?' Not more time in which to read, but the ability to read more in the time at our disposal has become the major issue. That is why the idea of speed reading has gathered momentum and many people are taking note of it. It is in response to our need that a new art has come to teach individuals to read more rapidly,

Results of the rapid reading programmes have shown that reading rate can invariably be increased to the tune of two to three times without any loss in reading comprehension. Speed evidently is a skill that responds readily to coaching and intentional practice.

In conclusion, it may be remarked that the challenge of knowledge explosion demands efficient readers. Estimates indicate that it took approximately 1,750 years for the first doubling of knowledge, 150 years for the second doubling, 50 years for the third, and only 10 years for the fourth. The fifth doubling may take five years or even less. Should we not then take the advantage of speed-reading programmes which seem to meet the challenge of our time ? □

# BOOK REVIEWS

## *Politics and Society During the Early Medieval Period: Collected Works of Professor Mohammad Habib, Vol. I*

Edited by Professor K. A. Nijami, People's Publishing House, Delhi, 1974,  
pp xvii+451, Rs. 50-00

THE HISTORY of medieval India has suffered from dangerous distortions and these distortions have in no small measure been responsible for promoting communal prejudices for generations. One of the major influences on modern historical writings on medieval India which presented a distorted picture of the medieval period of our history was an eight-volume work entitled *History of India as Told by Its Own Historians*.

Sir Henry Elliott who was then the Foreign Secretary to the British Government of India prepared a series of carefully selected sources of Indian history for the medieval period, which were edited by Professor John Dowson of Staff College, Sandhurst, and were published under the above title in the years 1867-77. The purpose behind was to divide the Indian people along communal lines and to prove to the Indian people the benevolence of British rule in India. Elliot frankly stated the purpose of these volumes in his introduction to the first volume. He wrote :

The few glimpses we have even among the short extracts in the single volume, of Hindus slain for disputing with the Muhammadans, of general prohibitions against processions, worship and ablutions, and of other intolerant measures, of idols mutilated, of temples razed, of forcible conversions and marriages, of proscriptions and confiscations, of murders and massacres, of the sensuality and drunkenness of the tyrants who enjoyed them, shows that this picture is not overcharged. They will serve to dispel the mists of ignorance by which the knowledge of India is too much obscured and show that the history of the Muhammadan period is yet to be written. They

will make our native subjects more sensible of the immense advantages accruing to them under the mildness and equity of our rule. If instructions were sought from them, we should be spared the rash declarations respecting Muhammedan India, which are frequently made by persons not otherwise ignorant.. We should no longer hear bombastic Babus, enjoying under our Government the highest degree of personal liberty and many more political privileges than were ever conceded to a conquered nation, rant about patriotism, and the degradation of their present position.

Elliot tried to paint the entire period of medieval Indian history in the darkest colours to prove that it was a period of barbarous oppressions, including religious oppression, and to dissuade the Babus from 'ranting about patriotism' by convincing them that under the British rule they were enjoying the liberties they had never enjoyed before, that they never had it so good. He also tried to prove that there were two nations in India, that the 'native' Hindu nation was conquered by the 'foreign' Muslim nation and that this foreign and Muslim tyranny had lasted for 600 years, until the 'liberation' of India by the British. In this introduction, Elliot also lamented that even the Hindu writers of medieval India wrote as if the Muslim rulers were Indians and that they did not express the sufferings of their people under the Muslims, that they did not rejoice at the collapse of the Mughal empire, and that they still longed for the days of the Mughal empire.

Elliot's eight volumes remained the basic source material for historians of medieval India for many decades and spread their communal poison. The approach to medieval Indian history laid down by him was followed by a large number of Indian historians, particularly when communalist politics arose in this country. The basic approach of Elliot was shared by both the Hindu and Muslim communalist historians because it served the purpose of both. It suited them both—the Muslim communalist because it helped him establish the separate nationhood of Muslims and to create the illusion among them that they had been rulers of this country for 600 years, and the Hindu communalist because it helped him promote anti-Muslim prejudice. The Hindu revivalist tendencies in historical writings further strengthened this trend. While to restore their pride, living under foreign rule, many Hindu historians made trips to the ancient times to find, or invent, food for self-respect, they presented medieval period as the dark period of Indian history.

In the twenties and thirties, there appeared a trend in Indian historical writing on medieval India, which has become predominant during the past two decades. This trend was both an expression of a genuine secular trend in our nationalist movement and represented efforts

to add to our understanding of medieval India. One of the earliest representatives of this new trend was Professor Mohammad Habib who died at the age of 77. Professor Habib's writings, spread over a period of nearly fifty years, are now being collected and published. They cover a vast range of topics, covering such areas as the political history of the early medieval period, the history of the Mongols, the political theory of the Sultanate of Delhi, Indian society and economy on the eve of Turkish conquest, studies in Indian Sufism, translations of medieval Persian works, etc. The present volume is the first in a series of the *Collected Works of Professor Habib* which are proposed to be brought out.

The first paper included in the present volume is "An Introduction to the Study of Medieval India" (A.D. 1000-1400)". First published in the *Aligarh Magazine* in 1931, the first part of this paper is a critique of the approach of Elliot in compiling his eight volumes *History of India*. While exposing the distortions in Elliot's presentation of medieval Indian history, Professor Habib wrote :

Most Anglo-Indian writers of textbooks on Indian history have confined themselves to a repetition of Sir Henry Elliot's platitudes. This was bad enough; but when education department used their authority to instil such vicious doctrines into the minds of the rising generations, the evil wrought was incalculable. Three-fourths of the communal fanaticism we see in India today is the result of these textbooks; they have misrepresented the Mussalmans to the Hindus and the Hindus to the Mussalmans and have tried to sap the foundations of Indians' self-respect (p. 8).

He concluded his critique by pointing out the political purpose that Elliot's misrepresentation was aimed to serve

An Indian critic will, nevertheless, be grateful to Sir Henry Elliot for the brutal frankness of his remarks; they show in a lurid light the historical misrepresentation which was necessary for his political purposes. A depreciation of our past history—a denial that it contained anything that was good and wholesome—was necessary in order to prevent 'bombastic baboos', not content with their 'small remuneration', from criticizing the 'high destiny' of the 'rulers of India'. But this was not enough. Communal hatred had to be encouraged. The peaceful Indian Mussalman, descended beyond doubt from Hindu ancestors, was dressed up in the garb of a foreign barbarian as a breaker of temples and an eater of beef and declared to be a military colonist in the land where he had lived for about thirty or forty centuries. All the opposite vices were attributed to the



Hindu. weak, emaciated from the excessive heat of the Indian plain, quiet in his manners, unambitious in his outlook, he was obviously a fit object for 'strategems and spoils' and had no right to complain when conquered by more virile races from colder climes (pp. 11-12)

The critique of the 'mischievous fallacies' which were rooted 'in the determination to visualize the past in the terms of the present either from political motives or through sheer lack of imagination' was the starting point for any objective study of the history of the Indian people in medieval times. Professor Habib emancipated historical writings on medieval India from the stranglehold of the current communalist controversies and historians' obsessions with passing black and white moral judgements. One of the most popular fakedoms related to the role played by religion in the Turkish invasions of India and, later, in the Delhi Sultanate. One of the most famous siorks of Professor Habib in the early period of his life was on Mahmud of Ghaznah. In this work he showed that the Indian campaigns of Mahmud of Ghazni were not inspired by any religious zeal or objective but were motivated by a desire for economic plunder to be used to expand conditions in West Asia after the rise of Islam, he showed that the kind and consolidate his kingdom in Central Asia. By making a study of the conditions in West Asia after the rise of Islam, he showed that the kind of monarchy that began to emerge in the tenth century did not find any sanction in Islam, and that the Caliph who was nominally the head of the Islamic world was a powerless figurehead by that time. He also brought to light the fact that while Mahmud's armies demolished temples and plundered their wealth, *Mahmud recruited thousands of Hindu soldiers who fought in many of his campaigns under an able Hindu general and that these Hindu soldiers in Mahmud's army enjoyed freedom of worship.* This work shocked the orthodox Muslim who believed Mahmud to have been the hero of Holy Wars and the communalist Hindu because he could no longer legitimately cite Mahmud's invasions as a major example of the aggressiveness of Islamic religion. Professor Habib immensely added to our understanding of the medieval Indian polity and its connection with Islam through the introduction he wrote to the English translation of *Fatwai Jahandari*, a fourteenth century work on political theory. Professor Habib wrote .

...under these (Indian) conditions, the wise kings adopted a policy of compromise and moderation. They paid a lip homage to the *shariat* and admitted their sinfulness if they were unable to enforce any of its provisions, they kept the state, controlled mullahs disciplined and satisfied; over the whole field of administration, concerning which the *shariat* is silent or nearly silent, they made their own laws; if the traditional custom of the people were against the *shariat*, they allowed them to override the *shariat*...

He quoted the words of Barni, the author of the tract on political theory "In all that the Kings do concerning necessary rules (*umur*) of kingship—the way they sit, get up, and go out riding, the order in which they sit on their thrones and compel the people to sit and perform the *sajdah* (prostration) before them—they follow with their hearts the customs of the Kusras (Persian emperors) who were rebels against God. In all their dealings with the people of God, they claim superhuman status (*fard*) for themselves; this too is opposed to (the teaching of) the prophet, it is a claim to partnership in the attributes of God and a cause for damnation in the next world" As for the popular description of Muslims as a homogeneous entity, as 'the rulers of India for 600 years', Professor Habib showed that the condition of the common Muslim was not very much better than that of the common Hindus. He quoted Barni who in his *Fatwa-i-Jahandari* protested against giving any power to low-born Muslims. Since Barni was afraid that education would make the low-born Muslims efficient and capable because of which they would be able to challenge and surpass their betters, he advocated that low-born Muslim boys should be prevented by state from getting education and anyone who ventured to teach them should be punished and exiled from the city. Professor Habib freed medieval Indian history from the distortions of Elliot and his Hindu and Muslim communalist heirs. With him, and with a few of his students and younger contemporaries, the proper study of medieval Indian history was inaugurated.

The present volume gives some idea of the enormous contribution of Professor Habib to our understanding of India's medieval past. It is divided into three parts dealing respectively with Approach and Method, India and Asiatic Environment, and Medieval Mysticism. The part dealing with Approach and Method includes, besides 'An Introduction to the Study of Medieval India' (of which the critique of Elliot's work is the first Section) mentioned before, Professor Habib's 'Introduction to Elliot and Dowson's *History of India*, Vol. II' and his 'Presidential Address to the Indian History Congress' at its first session held after independence. The Introduction to the Elliot and Dowson's Vol. II is, in a sense, a continuation of the first paper though it was written over 30 years after the first. This, in spite of its faults of exaggerating the impact of Turkish rule on Indian urban and rural life, is even today an essential reading for the students of medieval Indian history. The 'Presidential Address' is particularly valuable as it outlined the tasks of Indian historians after independence. In fact, the approaches indicated in it can be the yardstick on which to evaluate the entire historiography of medieval India since that address was delivered in December 1947. It appears that most of the work done in India since independence has been on the lines indicated by Professor Habib. Some of these may be mentioned here. In this address, Prof Habib said :

In days when we were suffering from an inferiority complex owing to the burtal fact of a foreign government, which seemed unshakable, we made the best we could of our medieval Rajput rajas and Turkish sultans. That attitude is no longer necessary, and the plain truth has to be told that all our medieval governments were intensely exclusive aristocratic organizations...We have, further, to squarely face the fact that our historical vision will and must undergo a complete change with reference to all our past History, of course, begins with fact-finding. But there are always gaps between facts and these have to be filled up by some sort of hypothesis. There is—the tendency of . a fairly large section of our own writers on ancient and medieval India, to live in a dream-world of their own construction. The temptation of pandering to the fanaticism of our culture-group or community, I feel confident, most of us can resist. But we have to take care that the traditions of our culture-group do not subconsciously colour our vision... Most writers of Indian history in the past, it has to be frankly confessed, have belonged to the 'bourgeois culture-group' and this fact has inevitably coloured their vision. Modern works on Indian history do not show any antipathy to the peasants and the working classes, but their attitude to the higher classes has been one of uncritical adulation ..the life of the Indian working classes has received scant attention at our hands...The great misfortunes under which they have laboured throughout the centuries go completely unnoticed.... Still the fact remains that we are content, like our predecessors, to survey the Indian social landscape from the foot of the royal throne. The lot of the Indian worker and everything connected with it...are a virgin field for the historical investigator...It is not our duty to knock down old temples, every element of value in them must be preserved. But we have to build a new shrine. The tendency towards socialism will gain in weight and volume as with every succeeding year the working classes strive to come to their own. The historian must not fail to do his duty by India as, in the generations to come, she marches forward courageously and hopefully to prostrate herself with reverence and devotion at the mist-shrouded steps that lead to the shrine of her new-found, classless God".

A survey of the historical works produced in India during the past 30 years would show that the concerns of Indian historian have indeed changed in the direction indicated by Professor Habib.

The papers included in the other two parts which were published in different journals many years ago, some over 50 years ago, have for

long not been easily accessible to the student. The compilation of these papers in one volume will satisfy a long-felt need. Some of the important papers included in these two parts are : 'Hindu Society in the Early Middle Ages', 'Indian Culture and Social Life at the Time of the Turkish Invasions', 'Hazrat Amir Khusrau of Delhi', 'Chishti Mystic Records of the Sultanate Period'. These papers had been first published a long time ago and much work has since been done on the problems these papers deal with. However, they have not diminished in their value and importance. For example, the monograph on Amir Khusrau which was published in 1927 was the first authoritative account of the great sufi saint-poet-historian by a modern writer. Though it is not a detailed biography (only about 65 pages) and in spite of the fact that much work has been published on Amir Khusrau since this monograph appeared about 50 years ago, it still retains its authenticity.

The editor and publishers of this first volume of Prof. Habib's *Collected Works* deserve the gratitude of the students of medieval Indian history. The materials included in this volume, however, raise certain questions regarding the planning of publication of the *Collected Works*. It would perhaps have been better if the materials to be included in these works had been arranged chronologically. This would have given some idea of the evolution of Prof. Habib's historical thought, besides being in conformity with the normal practice of publishing collected works. The editor seems to have tried to arrange papers in this volume according to themes. In that case, the monograph on Mahmud of Ghaznah should have found a place in the second part of this volume as it deals with the theme 'India and Asiatic Environment' much more than some of the papers that have been included. Or, have they planned a series of 'selected works'?

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## *Financing of Higher Education in India*

Dr Jagdish Lal Azad, Sterling Publishers Pvt Ltd., New Delhi,  
pp 2365, Rs. 40 00

THIS scholarly work is perhaps the first significant effort to make a comprehensive study of the system of financing higher education in India. The study has emerged mainly from author's doctoral dissertation which probes into the labyrinths of higher education finance. An attempt has also been made to analyse the patterns, procedures and policies of providing financial support to the institutions of higher education adopted by the State and Central Governments.

About 3 per cent of the national income was spent on education around 1969. Developmental expenditure on higher education in the central sector is rising at much quicker pace than the State sector because the U.G.C. has been concentrating more on the Central than the State universities. In order to bring about an integrated development of higher education, there seems to be no way out from entrusting its academic and financial administration to one single organization at the central level having a comprehensive programme of financial concessions for the economically handicapped but brilliant students.

There has been a continuing decline in the contribution from the private and other sources to the finances of institutions of higher education because of the tendency to lean more on the government and the general apathy of the public to social welfare programmes. There is an urgent need to mobilize private resources and efforts should continue to stimulate philanthropic contribution. The proposal relating to raising of fees may to some extent help overcome the paucity of resources but there is some element of fear that a rise in fees would prove to be a disincentive to the poor students.

Dr. Azad, in this study, has brought out that the states, by and large, have shown a tendency to accord higher priority to university education as against school education, which is amongst the Directive Principles of State policy. There is a need to adopt a policy of planned institutional spread so as to conserve the financial resources for higher education because it has also been noted in this study that the colleges for general education have not received appropriate attention in the allocation of financial resources.

Under the present situation of resource constraints, there is need for radical transformation of the academic and financial policies. It is, in fact, necessary to divert a large bulk of the aspirants for higher education to non-formal courses such as correspondence courses, evening colleges and non-collegiate studies. Steps need to be taken to streamline

the working of the private coaching institutions which have come up in large numbers in almost all the urban areas.

The author deserves appreciation for his very original and thought-provoking ideas and for the clarity with which he has brought to light some of the problems confronting the system of financing higher education in India in the post-Independence period.

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# Current Attitudes of People towards National Integration

Fr. P. C. EAPEN

READER, R.C.E. MYSORE

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*The purpose of the study is to identify and analyse the current attitudes of people towards national integration in India. The need and scope for improving the inter-group relations in our country are also examined. The study has also helped to develop a suggested programme for the promotion of national integration.*

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NATIONAL INTEGRATION has been a subject of discussion and study for some time in our country. It appears to have been studied from various perspectives. However, it seems that the goals set for integration have not yet been realized. We are a multiracial, multireligious and multilingual nation. Group prejudices as a social evil is the greatest obstacle to integration in our country. One of the stupendous tasks towards integration is the strengthening of the internal cohesion and unity of our country against the disintegrating forces created by the cultural, religious and linguistic differences prevalent among the citizens of our country. In spite of the apparent diversity we find in Indian society and culture, we will be able to identify an underlying unity as far as certain common characteristics are concerned. As Sir Herbert Risely has rightly pointed out: "Beneath the manifold diversity of physical and social type, language, custom and religion which strikes

the observer in India, there can be discerned a certain underlying uniformity of life from Himalayas to Cape Comorin" Mr V.A. Smith, the famous historian, speaking from his long experience of Indian life and culture, said: "The civilization of India has many features which differentiate it from that of all other regions of the world." Thus the Indianness of our people is something which runs to the very core of the personality of the average Indian, irrespective of his caste, creed, colour, language and economic position.

What is integration? Integration is not a negative concept. It is not synonymous with rigid uniformity or total absence of variety granting variations in language, religion and colour; it stands for respect for all creeds and ways of lives and does not permit any one of them exploit or thrive at the cost of the other. Integration in the final analysis is the mutual adjustment of units of social systems in a nation, whether these be persons in roles or subsystems, from the point of view of their contributions to the effective functioning of the system as a whole.

### *Statement of the Problem*

The main problem is to study the current attitudes of people towards national integration in India with a view to offer suggestions for improvement. The study of the main problem has lent itself to the study of the following sub-problems :

1. What is the present state of intergroup relations in India?
2. What are the current attitudes of people towards national integration in our country?
3. To what extent are they satisfactory and for what reasons? To what extent are they not satisfactory and for what reasons?
4. What could be done to help improve intergroup relations as a means to promote national integration?

Group prejudices and communal tensions as they exist today have all along been a social problem in our country. The deep-rooted religious and communal prejudices coupled with regional and linguistic chauvinism seem to have made inroads into the intergroup relations in our country. A negative social attitude may be considered as prejudice. Similar predispositions of disfavour in several groups of people turn out to be group prejudices. Studies to improve socially significant attitudes and to reduce prejudices are comparatively very few in India. The present study, therefore, is expected

to be quite relevant and appropriate since it has made an effort to understand the current attitudes of people towards national integration and developed a programme for the promotion of national integration in our country.

### *Methodology*

The present study is of an exploratory nature. A random sample of people from all walks of life belonging to various castes and communities in Bangalore city are selected.

Out of the various tools of research designed to yield quantitative measures, it was decided to use the Likert-type attitude scale and a questionnaire improved and finalized after a pilot study. Considering the popularity of the method and its many advantages, such as the ease and objectivity in construction of the scale, possibility of secrecy of individual responses, quick replications and final scoring and evaluation, this method was adopted for the present study.

### *The Sample*

The study is based on the analysis of data collected from 5,000 residents of Bangalore City, selected by using the random table from the latest voters' list (1972) prepared by the Bangalore Municipal Corporation. Of the 5,000 persons involved in the study, only 3,550 responses were complete and hence the analysis is based on only 3,550 responses.

The distribution of sample on the basis of sex, marital status, age, religion, educational status, employment status and average monthly income has been studied carefully in detail. The general attitude of people towards national integration appears to be quite favourable.

The mean attitude score of the sample is 166.7. The median is 165.95 and the mode is 164.45. As the mean is higher in value than the neutral point which is 135, obtained by multiplying  $45 \times 3$  where 3 is the neutral score and 45 is the number of items in the attitude scale, it can be inferred that the general attitude of the sample towards national integration is certainly quite favourable.

This sample was analysed to study the distribution on the basis of sex. The following table presents the distribution according to sex.

TABLE 1  
DISTRIBUTION OF SAMPLE ON THE BASIS OF SEX

<i>Sex</i>	<i>Number</i>	<i>Percentage</i>	<i>Mean</i>	<i>SD</i>
Male	2663	75.01%	167.376	16.45
Female	826	23.27%	167.355	16.39
Not mentioned	61	1.72%		

The difference in means of the attitude scores of males and females is very small. When this difference is tested for significance by using the 't' test the 't' value = .033. Since this is less than 1.65 we can consider that the small difference is due to the chance-variation and, in fact, there is no difference between the attitudes of males and females towards national integration.

TABLE 2  
DISTRIBUTION ACCORDING TO MARITAL STATUS

<i>Marital Status</i>	<i>Men</i>	<i>Women</i>	<i>Total</i>	<i>Mean Attitude</i>	<i>SD</i>
Married	1377	316	1693	166.68	16.42
Single	1287	509	1796	166.91	15.88

The difference in 'means' of the attitude scores of married and single persons is .23. The unmarried people are having a mean higher than that of the married. When this difference is tested for significance using the 't' test the 't' value = .42, which is less than 1.65. Hence the difference is not significant. This would mean that there is no significant difference between the attitude of married and single persons towards national integration.

TABLE 3  
DISTRIBUTION OF SAMPLE ACCORDING TO AGE

<i>Age</i>	<i>N</i>	<i>M</i>	<i>SD</i>
Below 25 years	1474	166.291	15.66
25 — 29	837	165.71	15.17
30 — 39	553	168.16	16.29
40 — 49	298	169.298	18.04
50 — 59	101	168.86	18.79
60 and above	78	173.987	15.02

Attitudes have been calculated separately according to the age of people selected for the study. The distribution of the age-group of people selected for the study appears to be positively skewed while the attitude appears to be quite favourable. The higher the age, the greater the degree of favourableness towards integration.

# CURRENT ATTITUDES TOWARDS NATIONAL INTEGRATION

TABLE 4  
DISTRIBUTION OF SAMPLE ON THE BASIS OF RELIGION

<i>Religion</i>	<i>Mean Attitude</i>	<i>SD</i>	<i>N</i>	<i>Percentage</i>
Hindus	166.925	16.46	2779	78.28%
Muslims	165.772	15.54	236	6.65%
Christians	165.34	14.27	381	10.73%

From the above distribution of cases and the mean attitude scores studied, it appears that all people irrespective of their religious affiliation are having quite favourable attitudes towards national integration.

TABLE 5  
DISTRIBUTION OF SAMPLE ON THE BASIS OF EDUCATION

<i>Education</i>	<i>Number</i>	<i>Mean</i>	<i>Variance</i>	<i>Percentage</i>
High school	991	162.16	207.74	27.92%
Under graduates	1102	165.17	232.39	31.04%
Graduates	1141	171.4676	259.2	32.14%
Post-graduates	204	173.275	311.71	5.75%

The above table reveals that there is positive relationship between education and attitudes towards national integration. The more a person is educated the more he is inclined to entertain favourable attitudes towards national integration.

TABLE 6  
DISTRIBUTION OF SAMPLE ON THE BASIS OF EMPLOYMENT

<i>Employment</i>	<i>Number</i>	<i>Mean</i>	<i>Variance</i>	<i>Percentage</i>
Employment by others	1753	168.841	288.81	49.38%
Self-employed	810	165.636	235.5	22.82%
Unemployed.	338	168.0119	265.65	9.46%
Not answered	661			18.34%

The respondents have been divided into three categories. The first category consists of the people having salaried positions. The second one consists of those who are running business on their own (self-employed) and the third category comprises mostly the educated unemployed and students.

The difference between the attitudes of people employed by others and the self-employed has been studied. The difference is highly significant. When the difference is tested for significance by using the 't' test, the critical ratio is 4.746 which is greater than 2.58. Hence it can be inferred that the people employed by others (salaried class) are having a more favourable attitude towards national integration than those who are self-employed.

TABLE 7  
DISTRIBUTION OF SAMPLE ON THE BASIS OF ECONOMIC STATUS

<i>Income</i>	<i>N</i>	<i>Mean</i>	<i>Variance</i>	<i>Percentage</i>
A —Rs. 2000 and above	42	171.17	394.86	1.18%
B —Rs. 1000-1999	176	174.33	263.15	4.96%
C —Rs. 700-999	284	171.96	308.52	8%
D —Rs. 500-699	393	168.19	276.7	11.07%
E —Rs. 400-499	520	166.94	218.85	14.65%
F —Rs. under 400	1401	163.62	240.41	39.46%

The economic status of the people selected for the study has been determined by the average monthly income.

The difference between the means of group F and E is  $166.94 - 163.62 = 3.32$ . The standard error is calculated and found to be .7703. When the difference is tested for significance by using the 't' test the critical ratio is 4.3102. Hence the difference is significant beyond 1% level of confidence and it is inferred that the people having an income between Rs. 400-499 show a more favourable attitude towards national integration than the people having an income below Rs. 400. The difference in the income when tested for significance using the 't' test has revealed that the higher the income the more favourable the attitude towards national integration.

The concept of a pluralistic society made up of many communities, with their separate identities, needs more study in the organization of modern alternatives to the traditional social institutions. Communal prejudices and separatist tendencies that are now dividing the country must be counteracted with a programme designed to develop better human relationships and understanding. This can only be realized through democratic educational practices, based on the following suggestions:

1. Recognition and acceptance of the existence of a wide range of caste and class groups in the context of the diverse religious settings in which they operate.
2. The acceptance of intergroup relations as a matter of concern for all, irrespective of caste and creed.

3. An explicit dynamic code of ethics to be developed to motivate and direct personal behaviour and group relations.
4. A confidence in the integrity and the moral worth of the individual and a genuine faith in social change as a means of progress, together with an optimistic view of the future, as it pertains to social problems.
5. Recognition of the need for promoting human relations education through inter-faith understanding and inter-faith collaboration which should result in respect and regard for others beyond caste and community lines
6. Formation of voluntary organizations like cooperatives and neighbourhood groups to encourage change of behaviour and to develop a favourable climate for social reform and change of attitude.
7. Recognition of academic freedom in reorganizing curricula to meet the needs and aspirations of the people
8. Preparing teachers to be intellectually and emotionally sensitive to the diagnosis and solution of social problems in school and the community
9. A willingness to assign to schools, as part of their educational task, roles in the study and solution of social problems.
10. Recognition on the part of educational institutions to take up research studies on prejudices, to offer suggestions for easing tensions and promoting intergroup understanding.

The preceding suggestions are basic to any educational programme that seeks to improve intergroup relations. If the concept of "unity in diversity" has any realistic value, the leadership has to respect the concept of "manyness". People may remain different and still work together for a common cause. The problems that create mutual distrust, hatred and jealousy should be attacked, not merely by singing the national anthem together, but by cooperative endeavours which help people to understand themselves and others. Education for better human values involves activities of both the mind and the heart. When both are in harmony the gap between what we profess and what we practise tends to close

#### *Summary of Findings and Recommendations*

The study has attempted to find out the current attitudes of people towards national integration. A stratified random sample of 5,000 residents of Bangalore City has been selected according to the Municipal Corporation voters list, using the random table. The current attitudes of people toward national integration is quite favourable



It has been found that there is no significant difference in the attitudes towards national integration between men and women, married and single. The higher the education and the economic status, the better is the mean attitude score, which indicates a very favourable attitude towards national integration. There is a tendency for the mean attitude score to increase with increasing age of people which shows that mature adults have a more favourable attitude towards national integration than youngsters. The present study has also established that people employed by others (salaried class) have a better attitude towards national integration than the self-employed and the unemployed.

Thus with the new trends of national integration pointing towards change and reform, the overall empirical evidence optimistically indicates that people will cooperate with and initiate new programmes for reform in the country, not only because of special interest but also for the realization of the basic values of a democratic commitment. An examination of the high scores in each of the items in the questionnaire indicates the need for concerted effort not in the direct lines of command to the social system but in the general programming of human relations.

Those who recognize intellectual autonomy and who regard institutionalized evil as a target for action are ready for reform in the community, the government, the school, the business world and the civil services. They are currently open to consider with great seriousness the problems of ignorance, prejudice, stereotypes, scapegoating and communal disharmony. If the leaders of the community are able to perceive the great relevance of these issues for communicating the message of better intergroup relations in our times and if the line of authority is still absorbed in a fatalism that focuses on solutions of human suffering only at the transcendental level or as service to the indigent, then the near future for the nation will be one of painful misunderstanding as line and staff pull in different directions to achieve similar ends, namely, communal harmony and national integration. The evidence from the data here is hopeful for realization of these value-based changes.

For the immediate future, the critical factor, then, in administration is training of leaders and teachers under the auspices of a National Council for Integration to be established as a nation-wide autonomous organization under the Ministry of Education and Social Welfare. This study in its analysis of the problems of national integration indicates the need of sociological and psychological training for those whose work lies in the sphere of intergroup and human relations.

Several clusters of evidence indicate that persons of lower social class membership suffer from a syndrome of disability—physical, mental, economic—and that this syndrome is related to a general impoverishment in life. The impoverishment involves a narrowing of the cognitive and emotional

range and of the repertoire of available social roles. The individual feels remote from the main currents of his society, alienated from some of its most cherished values, and deficient in self-respect. Prejudice toward members of other groups is also most pronounced in those of lowest socio-economic status. Therefore, it would seem that intergroup relations, education and mental health should be promoted in a very concentrated fashion to work with that strata in our society whose need for such effort is apparently greatest.

Among the indices of community disintegration, the following characteristics seem to have implications for intergroup relations problems:

1. Few and weak associations
2. High frequency of hostility
3. Weak and fragmented network of communications
4. Cultural confusion
5. Hypercriticism of others
6. Blurred self-concept
7. Schools functioning in isolation from the needs and aspirations of people perpetuating academic rigidity

This affirms the binding of intergroup relations to other aspects of individual and group life. Indeed it implies that education for improved intergroup relations is the basis for the promotion of national integration through the maintenance of a healthy community life and a healthy individual personality which a nation-wide autonomous organization alone can initiate and propagate meaningfully.

Beyond these specific conclusions applicable to Bangalore City and perhaps generalizable at least as hypotheses for a number of other urban centres, currently pressured for integration, the results suggest that the same tools could be used to examine current attitudes of people towards national integration by replicating the study in different cosmopolitan urban centres in our country.

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# Effect of Individual Counselling on the Achievement of Bright Underachievers

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NO DEVELOPING nation like ours can afford to ignore the human resources available to it. The present technological pressures have particularly sharpened the awareness of our short-sighted failure to identify and develop many of our most promising minds in keeping with the potential. Extraordinary talent unidentified and undeveloped is a tremendous waste. In India, the need for the identification and development of talent has been recognized. The Kothari Education Commission (1964-66) has also commented on the "need of the search and development of talent". It has made several proposals which will assist in the programme for discovery and development of talent. The Commission has mentioned the need of diagnosing the causes of underachievement which hinder the underachiever in coming up to the level of latent abilities and then to provide remedial treatment.

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\* This is the report of an official study taken up at the Department of Educational Psychology and Foundations of Education, National Institute of Education, National Council of Educational Research and Training, during 1968-1970.

## REVIEW OF RESEARCH

Researches have been conducted in other countries using counselling as a technique, besides various administrative procedures to help the bright underachievers in their studies.

In a study by Broedel (1959), a group of bright underachievers was divided into an 'experimental' and a 'control' group and counselling was offered. The experimental group's behaviour and performance on an achievement test increased significantly 16 weeks after counselling. Baymur and Patterson (1960) used different techniques of counselling with some underachieving high school pupils. There did seem to be some tendency for the counselled students to have a higher-grade point average. Shaw (1961) initiated a family counselling technique for underachievers and their parents and he found the technique to be quite effective.

Shaw and Grubb (1958) on the basis of their study recommended that "some form of remedial help, possibly in the form of intensive counselling is needed."

Many researches have been conducted in India and abroad to investigate the factors, intra-individual as well as environmental, which may affect the achievement of an individual adversely.

Hilton and Myres (1967), Bruner and Caron (1959), Pierce (1960), Hildreth (1966), and Mehdi (1965) emphasized that motivational factors were associated with poor achievement of bright underachievers. In Drake's (1962) words the underachievers are lacking in "academic drive". According to Shaw and Grubb (1958), Morrow and Wilson (1961), Kitano (1959), Salzinger (1957) and Semler (1960), adjustment problems interfere with the academic success of these pupils. Gowan (1960) on the basis of a review of a number of studies by various persons, lists factors such as weak egocontrol, withdrawal and self-sufficiency, poor use of time and money, neurotic tendencies and lack of self-confidence. Shaw (1961), Walsh (1956) and Mehta (1968) reported that the bright underachievers had more negative self-concept than their achieving counterparts.

Joshi and Sharma (1967), Deo (1968) and Humphreys and Traxler have listed factors like dislike for parents, fatigue, conflicts, health problems, poor emotional adjustment, nutritional deficiency, etc. which they think are related to low achievement of the bright underachievers.

Deo (1968), Barrett (1957), and Pierce (1960) emphasized that poor school environment, poor study habits and negative attitude towards school, the value system of the family, parents' attitude toward the child and education affected the child's achievement to a great extent.

Gowan (1960) concluded that the authoritarianism in the parental home, parents not having definite goals and imposing impossible demands on

children, were among the major reasons of underachievement in the child.

In summary, it is clear that a few studies have shown positive effect of different counselling techniques used with underachievers, and many studies have discovered various factors associated with underachievement.

### PURPOSE OF THE STUDY

The objectives in mind for conducting the study were:

1. To study the effect of individual counselling on the achievement of bright underachievers in the Indian context, since no such study was ever undertaken in India.
2. To find out some of the probable factors associated with underachievement of the bright pupils in a school in New Delhi.

The basic assumption underlying the study was that there are some non-cognitive factors influencing academic achievement of the pupils and the influence of these factors can be overcome by the pupils themselves if some guidance is provided. For the present study, individual counselling had been used as a technique of guidance and it was hypothesized that there would be an improvement in the achievement of the bright underachievers after individual counselling. An effort was also made to identify some of these non-cognitive factors associated with the underachievement of the bright underachievers.

### PROCEDURE

#### *The Sample*

The sample for the study consisted of 20 bright underachievers studying in Classes VII through XI of a school in New Delhi. The tests used for screening the bright students were three mental ability tests: Nafde's non-verbal test of intelligence, verbal reasoning and abstract reasoning tests of Differential Aptitude Test Battery. The bright pupils were those who were placed in the top quartile of the distribution of above three mental ability test scores. The underachievers were those bright pupils who did not obtain A grade in their school examinations and who in the teachers' opinion were also rated as bright underachievers. To confirm the ability level, Terman-Merrill Test—Form L (1938) was administered individually by the investigator.

*Collection of data*

1. *Interviews with pupils, teachers and parents* Each subject filled a student information blank and he was interviewed also to obtain information about home, family, health, school, subjects, and peer group, etc. to have an insight into the causes of underachievement. Similarly, the teachers were also interviewed to obtain their views on the underachievement of the pupils. The parents of all the subjects provided information on family data blank. Some of the parents were also interviewed.
2. *Scholastic achievement* The marks of two terminal examinations held in May and September were collected in main subjects, viz., languages (Hindi and English), mathematics, science and social studies, i.e. classics and science subjects. The examination marks for these subjects were also collected after counselling and all the examination marks were converted into stanine grades to make them comparable from one subject to another.

## THE COUNSELLING PROGRAMME

After the collection of data individual counselling was started. All the 20 pupils, included in the sample, were taken up for individual counselling. Three or four sessions of counselling were held according to the nature of the problem and the need.

The counselling approach utilized was not merely giving a simple advice but the main aim was always to help the child in self-accepting, self-understanding and self-actualization. The pupil was encouraged to reveal his difficulty and ultimately both considered all the possible solutions to that particular difficulty or problem. It was a collaborative effort to solve the pupils' problems. A permissive attitude was maintained throughout the counselling process.

It was to help the counsellee to reflect upon pertinent aspects of his problem until he had progressed to the point of taking a positive approach to the central problem.

After identifying the problem, the counsellor helped the counsellee develop a plan of action for effective studies, better results in exams, etc. Sufficient time was given in between the counselling interviews so that the pupil may have a better understanding of and insight into the problem. In some cases the counsellor had given direct suggestions and in some other pupils themselves suggested the possible solution to their problems.

The purpose of the counselling was to help the pupil grow and to enable him to solve all his problems independently without any help from

others in future. In many cases pupils could foresee many future problems related to their educational and vocational life and discussed them with the counsellor and in most of the cases they themselves were able to give plausible solutions to these problems. It shows that growth and learning took place in the pupils after individual counselling.

### *Analysis of data*

The pre and post-counselling marks were tabulated to indicate the changes in the achievement stanines as a result of counselling separately for each school subject and for all the subjects taken together. Table 1 shows pre and post-counselling positions of pupils in terms of achievement stanines in the aggregate.

TABLE 1  
ACHIEVEMENT OF PUPILS IN THE AGGREGATE BEFORE AND AFTER  
INDIVIDUAL COUNSELLING

#### ACHIEVEMENT BEFORE COUNSELLING

ACHIEVEMENT AFTER COUNSELLING	Stanines	IX	VIII	VII	VI	V	IV	III	II	I	Total
	IX	—	3	1	—	—	—	—	—	—	4
	VIII	—	—	—	—	1	—	—	—	—	1
	VII	—	—	1	1	—	—	—	—	—	2
	VI	—	—	—	—	4	—	—	—	1	5
	V	—	—	1	—	1	2	—	—	—	4
	IV	—	—	—	—	—	1	—	—	1	2
	III	—	—	—	—	—	1	—	1	—	2
	II	—	—	—	—	—	—	—	—	—	0
	I	—	—	—	—	—	—	—	—	—	0
	Total	0	3	3	1	6	4	0	1	2	20

It is evident from the above table that in the pre-counselling situation no pupil had shown high achievement (Stanine IX), six pupils were having above average achievement (Stanines VII and VIII), eleven pupils had average achievement (Stanine IV, V and VI), one pupil had below-average achievement (Stanines II and III) and two had low achievement (Stanine

I). As a result of counselling four pupils were placed in the high achievement group (Stanine IX); they belonged to average category of achievement in the pre-counselling situation. Three pupils were placed in the above-average group, of which two had already belonged to this category but one improved from the average group. Eleven pupils were found in the average category after counselling. Two pupils, whose achievement was low before counselling, moved into the average category and there remained no pupil in the low achievement category. In the below-average achievement group, two pupils were placed, one was already there and one of the average pupils (Stanine IV) descended into this category (Stanine III). Thus, it is seen that the improvement in high category was from 0 to 4, and in the low achievement category it was 100 per cent. There was 9 per cent deterioration in the average achievement group. The individual counselling can be regarded as effective in improving the achievement of bright underachieving pupils.

To statistically test the significance of this improvement, Wilcoxon-matched-pairs signed-ranks test was applied which showed that the improvement was significant at .01 level for one-tailed test ( $N=20$ ,  $T=15.00$ ).

The Wilcoxon-matched-pairs signed-ranks test results for one-tailed test for school subjects were found to be as under:

<i>Subject</i>	<i>N</i>	<i>T*</i>	<i>Level of Significance</i>
English language	18	77.0	Not significant at .01 level
English literature	14	45.0	Not significant at .01 level
Mathematics	14	16.5	Significant at .01 level
Hindi	17	37.5	Not significant at .01 level
General science	14	56.5	—do—
History	18	18.0	—do—
Geography	10	3.5	Significant at .01 level

\* T is the sum of the like-signed ranks

*Factors associated with underachievement.* An analysis of the problems revealed by the pupils during counselling sessions, fact-finding interviews with teachers and some of the parents revealed various factors which were related with underachievement. Those factors could broadly be grouped into the following categories: (1) Psychological factors, (2) Physical factors, (3) Familial factors, and (4) Educational factors.

The distribution of 20 pupils over these factors is shown in Table 2



TABLE 2  
DISTRIBUTION OF BRIGHT UNDERACHIEVERS ACCORDING  
TO THE FACTORS OF UNDERACHIEVEMENT

<i>Factors</i>	<i>Cluster of Characteristics</i>	<i>Frequency of cases</i>
1. Psychological	(i) Motivational	8
	(ii) Emotional disturbances (nervousness, anxiety)	4
	(iii) Lack of self-confidence	3
2. Physical	(i) Weak eye-sight	1
	(ii) speech defect (stammering)	1
3. Familial	Position of the child in the family and the attitude of parents	1
4. Educational	(i) No guidance at home	1
	(ii) Poor study habits	1

The number of pupils having physical, familial, and educational factors is insignificant. The most important factors associated with the underachievement seemed to be psychological factors and in that category also motivational causes predominated. However, it may be worth mentioning that there was no single factor associated with low achievement of the bright underachievers in the school, rather there were multiple factors found in each case. More frequently than not there was overlapping of causes, e.g. in a case when speech defect like stammering was there, lack of self-confidence and consequently, a feeling of inferiority crept in.

### CONCLUSION

Counselling as a guidance technique can be effective to help the bright underachievers improve their academic achievement, as is obvious from the trends shown in the study. If with such a short duration of individual counselling, there can be some improvement in the achievement of the underachievers, it may be recommended that there should be a full-time regular school counsellor or even a part-time school counsellor with a well-organized on-going guidance programme in as many schools as possible to help the bright underachievers with counselling and various other individual and group techniques of guidance. Certain factors associated with the underachievement of the bright pupils have also been detected. It is felt that bright underachievers and the factors associated with their achievement should be identified at an early stage to avoid unnecessary wastage and stagnation of the valuable talent of the nation and to

plan out and implement some remedial programme in schools to help factors responsible for underachievement. The pupils may be offered "motivational counselling" well in time

Some action research programmes may be designed to test ways in which group and individual techniques of guidance programme can be used with bright underachievers, and modification of environment such as through working with teachers and parents which can be of help in reducing underachievement, and improving the school climate in general.

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# Review of Research on Simulation Games and Their Impact on Attitudes

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*Fourteen research studies pertaining to simulation games and their impact on attitudes are reviewed, after discussing the objectives of using simulation games in the social studies education. A few general comments summarizing the review are given below.*

*It appears that simulation games have a positive influence on student attitudes, though attitudinal change resulting from simulation game may not be as strong as has been claimed*

*Some of the studies reviewed reveal inadequate testing procedures and research design. Some of them lacked control groups. This presented the difficulty of determining whether the results obtained were due to simulation or to some incidental experience. Moreover the control for a possible Hawthorne Effect was usually missing.*

*The validity and reliability of measuring devices is, in some cases, open to question. Most of the studies used "home-made" devices which required further validation.*

*In most cases, it is difficult to generalize beyond the given situation. That is why 'replications' in a more systematic way are required.*

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FOR THE last ten years the use of simulation games, especially in the social studies education, has been popular. Though the research evidence for their utilization in the classroom is not conclusive, their usage in the classroom has been increasingly gaining acceptance. Some overzealous

educators are claiming this new technique, provided by modern technology, as a 'magical means' to spark interest in the otherwise insipid atmosphere in the classroom. The lacuna in such a claim, however, is that, as it is with most innovations in education in recent years, the research evidence for simulation games is not adequate.

Simulation provides the simplified version of reality—an approximation of reality. Participants are provided with the opportunity to experience vicariously the interaction situations which are created from a pre-planned theoretical framework. Usually the simulation, the simplest form of gaming, involves competitive encounters between individuals that usually require some degree of skill, and/or luck. Simulation games are considered to be pleasant and stimulating diversions which usually involve some learning, while following the 'roles' as well as 'rules'.

Simulation games are considered to be good 'motivators' in leading the students to more sophisticated and productive inquiry. Skill development is another objective of the simulation games. Students practise in executive-decision-making skills when they are given the opportunity of allocating resources, communicating, persuading, influence-resisting, 'politicking' and policy-making. The students also learn concepts, broad generalizations, complex theories, structures and contents of the model which lie behind the simulation. More important, the simulation has very cordial effect on the social setting as the teacher loses his authoritarian role in which learning takes place. Still more significant is the claim that simulations lead to personal growth and they affect attitudes and interests.

As it is hinted above, some researchers have welcomed the use of simulation in the social studies classroom and described it as 'the ideal method' for modernizing the social studies curricula, especially at the secondary level. Simulation, a dynamic technique, must be tried to be appreciated. Even Jerome Bruner gives psychological credence to simulation games when he makes the point that

the provision of vicarious experience is a necessary adjunct to other modes of learning. Much student apathy concerning politics and national issues may be due to the relatively long postponement of adult roles and to the presentation of abstractions or facts that are outside the student's real life experience. On the basis of trials in a small number of colleges and high schools, reactions of students and teachers suggest that social scientists may be developing in simulation a most effective means of bringing distant policy realism within the individual's personal experience in a manner which cannot be matched by other teaching materials.<sup>1</sup>

Contrary to the above glorifying claims, other researchers have been more wary in their support for the simulation games.

If in reading this . the reader begins to develop the nagging suspicion that our discussion is not a ringing endorsement of educational games and simulations as the only answer to all teaching problems, his critical reading antenna is working well. Although the exercises . are an extremely useful and interesting part of a teaching-learning experience, they are not effective without other curriculum support, i.e. other materials, other activities, other media, and a well-prepared teacher. Preliminary evaluations from teacher-users indicate that the best exercises provide the most effective teaching-learning experiences when used as part of a total curriculum plan.<sup>2</sup>

A few studies on simulations and their impact on attitudes are reviewed here. Some of the reviews included, I must say, are 'reviews of reviews.'

Let us start with Cherryholmes<sup>3</sup> evaluation of six simulation studies, including his own Master's thesis. These studies include: Anderson<sup>4</sup> (1964); Boocock<sup>5</sup> (1963); Boocock and Coleman<sup>6</sup> (1965), Cherryholmes<sup>7</sup> (1963); Garvey and Sciler<sup>8</sup> (1966); and Robinson, Anderson, Hermann and Snyder<sup>9</sup> (1966). Cherryholmes advanced many propositions to cover major foci of the research studies mentioned above. The last of his propositions, which concerns us the most, was that "students participating in a simulation will have their attitudes significantly altered relative to attitude-change produced by conventional classroom methods". Out of these six studies only three were concerned in some way or the other with attitudes.

In the above evaluation, Cherryholmes concludes that Boocock's study shows that playing the election game produced realistic attitudes about politics. After the game, the players, as opposed to students in the control group, were less likely to "expect our representatives to vote according to their convictions" and more likely to say that "the best way to win elections is to study the voters and then take stands on issues that will be consistent with the voter's opinions". An interesting point about these findings is that the research in political science reveals that this is, in fact, the way Congressmen operate. Another attitudinal change was that the students who played developed negative evaluation of a career in politics, while this did not happen in the control group.

Cherryholmes also found in the participants the evidence of realistic attitudes after playing the Inter-Nation Simulation. However, Garvey and Sciler, with a slightly modified version of the same attitude inventory, did not find a significant difference between the simulation and the control group.

Cherryholmes' evaluation of the above studies concludes that the case for learning and attitude change resulting from simulation games may not be as strong as has been claimed.

Hart's study<sup>10</sup> dealt with the differences in polarization of attitudes and degree of cognitive learning between treatment and control groups, the former having been exposed to a simulation experience. Seventy-six students were divided into two treatment and two control groups. One treatment and one control group received pre-tests; all groups received post-tests, using the semantic differential to test differences in positive and negative responses to political concepts, and course unit tests to measure cognitive differences between groups. The data were analysed by co-variance analysis and Chi-square and t-scores were determined. There were no statistically significant differences in degree of polarization of attitudes between groups exposed to a simulation experience and groups which were not.

The purpose of Corbin's study<sup>11</sup> was to determine to what extent the student attitudes regarding political, economic, and social issues in the United States are affected by participation in a simulation game on South-East Asia. The game was developed, tested and refined by the investigator. The results of the study indicate that simulation can be gainfully used in the social studies programmes. Although the measurement of attitudes and attitude change is an imperfect procedure at best, the study showed that student attitudes toward specific problems in the United States are affected by participating in a simulation game about South-East Asia. Attitudes not deeply imbedded in the American core values proved to be the most amenable to alteration. This study seems to lend a measure of credence to the idea that individual's view of issues relevant to his society is affected by an understanding of an alien culture.

The following hypothesis posed by Mountain<sup>12</sup> in the evaluation of one hundred educational games and devices selected for the study was upheld: "Educational games can serve as useful teaching aids in introducing and reinforcing knowledge, attitudes, and skills in language arts, arithmetic, and social science."

The validity and reliability of the procedures adopted by the investigator are open to question. However, the study has supplied the teaching profession with a source of detailed information on one hundred tested games and devices for classroom use.

Dekock<sup>13</sup> and his colleagues attempted to measure the attitudinal changes after a participation in a simulation game ("Sunshine" dealing with racial issues), developed, tested and refined locally. Though their analysis lacks statistical sophistication, the scores showed that there was a positive change toward tolerance and acceptance of differences on the part of the participants. However, the study cannot be generalized.

Boags<sup>14</sup> attempted to examine change in selected affective factors which learners bring to a Simulation-Game situation to measure any relationship between affective orientation and cognitive learning in this setting. He used 56 graduate students pursuing Master's Degree in Social Work Education in two settings, one competitive and the other cooperative. Participation in the treatment included an administration of the Moods Adjective Checklist (MACL) to measure attitudes and attitude change. The subjects in the cooperative setting showed a greater positive change than those in the competitive setting.

Targ<sup>15</sup> sought to examine the developments in children's orientations to national and foreign-policy-making and international politics and the impact of an elementary school version of the Inter-Nation Simulation on these orientations—beliefs, expectations, action preference about nations, etc. The research was conducted on the fourth, fifth and sixth grade students (age-group 9-12 years). He found that students became more tolerant and positive in their beliefs after their participation in the game. Findings also indicate that the greatest effect appears to occur at the lower grade levels, particularly the fourth grade. However, these findings should be taken with a note of caution because of limitations in sample selection and questionnaire reliability.

Vogel<sup>16</sup> attempted to find out the effect of a simulation game ('City Council') on the attitudes of political efficacy of the sixth grade students. The students, after playing the game, showed significantly more positive attitudes of political efficacy compared to the group of students using a traditional method of instruction.

Research evidence on simulation games is accumulating fast, though volume does not indicate any appreciable degree of improvement in quality. From the above review of research on simulation and their impact on attitudes, a few general comments are in order. But then, the comments can be generalized only with specific reservations.

1. It appears that more research studies deal with simulation vis-a-vis cognitive domain than affective domain.
2. Some of the studies reviewed reveal inadequate testing procedures and research design. Some of them lacked control groups. This presented the difficulty of determining whether the results obtained were due to the simulation or to some incidental experience. Moreover, the control for a possible Hawthorne Effect was usually missing.
3. The validity and reliability of measuring devices, is, in some cases, open to question. Most of the studies used 'home-made' devices which required further validation.
4. It appears that simulation games have a positive influence on student



attitudes though attitudinal change resulting from simulation games may not be as strong as has been claimed.

5. Incidentally, (though not directly related to our topic under examination) many studies seem to indicate that students participating in a simulation game enjoyed such an experience more than the traditional day-to-day classroom activities.

6. In most cases, it is difficult to generalize beyond the given situation. That is why 'replications' in a more systematic way are required.

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# An Analysis of Classroom Verbal Interaction of Elementary and Secondary Teachers

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In the present study an attempt has been made to analyse the teacher-behaviour of elementary and secondary teachers. It may provide an evidence for the proposition that the level of teaching determines the operations involved in teaching or teacher-interaction in the classroom.

G.A. Cortis<sup>1</sup> (1970) has also designed an investigation for the elementary and secondary teachers in the U.K. and concluded that the elementary teachers there appear more rigid and insensitive, coming from a more densely populated area. The secondary teacher, on the other hand, is more sensitive, more satisfied with his work and has more 'progressive' educational attitudes than those of the elementary teachers.

D.G. Ryans<sup>2</sup> (1960) found that the educational viewpoints expressed by secondary teachers were more traditional or learning-centred in nature, while those of the elementary teachers are more in the direction of

premissiveness. Within the secondary school, science and mathematics teachers appeared more traditional in their viewpoints, while the English and social studies teachers appeared more permissive.

The male teachers at both the elementary and secondary levels appeared to be markedly more emotionally stable than the female teachers. More favourable attitudes towards pupils were expressed by the female teachers in the secondary schools, but the elementary male teachers possessed more favourable pupil attitudes than did the female teachers.

M.B. Buch and M.R. Santhanam<sup>8</sup> (1972) found significant relationship between the 'exit' behaviour (8-3) cell and 'entry' behaviour. The findings would be a valuable compliment to our pursuit in the realm of strategies for promoting creative inquiry in the classroom.

Qurashi (1972) studied the relationship between the teachers' personality variables and their classroom behaviour, using the FIAC system. He found the teacher attitudes to be associated with classroom behaviour of teachers. Santhanam (CASE, 1972) studied the relationship between non-personality variables of the teacher and his classroom behaviour. Jangira (1972) reported a successful experiment in modifying classroom behaviour of teachers by using feedback based on the FIAC system. Pangotra (1972), in an experimental study of the effect of different sources of feedback on student teachers, found that feedback from peers, the researcher or the pupils. Roy (NCERT, 1970) also studied modification of teacher behaviour. Sharma (1972), in an experiment studied the effect of four different patterns of classroom behaviour of teachers on pupil achievement in relation to knowledge, comprehension and application as instructional objectives. Jangira (1972) in his study for modifying classroom behaviour of teachers, found that higher responsiveness, flexibility in teacher influence and indirectness resulted in higher pupil adjustment. Pareek and Rao (1971) also found a significant relationship between indirect teacher influence and pupil adjustment.

The review of research reveals that studies conducted for primary and secondary teachers have been confined to cognitive and affective aspects. But no study has been designed so far for analysing the teacher behaviour in the elementary and secondary classrooms. S.K. Singh<sup>5</sup> (1974) found that teaching attitude is a significant determinant for teacher behaviour. In the present study, an attempt has been made to analyse the effect of situational factor for verbal interaction of teachers in terms of elementary and secondary school teachers.

The present study aims at analysing the difference in verbal interaction between the elementary and secondary teachers in Indian conditions.

## HYPOTHESES

Under this study the following hypotheses were formulated and tested.

- The elementary teachers differ significantly from secondary teachers with reference to their verbal interaction.
- The elementary teachers involve more pupil participation in classroom teaching than the secondary teachers.
- The secondary teachers provide more opportunity for pupil initiation than the primary teachers in classroom interaction.
- The teacher question-ratio of secondary teachers is higher than that of the elementary teachers.
- The elementary teachers have more teacher-response ratio than the secondary teachers.
- There is no difference between elementary and secondary teachers for their teacher-talk and steady-state ratio.

## METHODOLOGY

The normative observation method was used for encoding the classroom interaction. The Flanders Ten Category System<sup>6</sup> was taken up for encoding the classroom verbal interaction. Two observers completed the encoding work of classroom interaction. The observers' reliability was estimated by Scott's Formula<sup>7</sup>. They maintained 79 per cent level of agreement.

A sample of 100 teachers (50 elementary and 50 secondary) was selected from institutions of Meerut district through cluster sampling technique. The sample consists of 50 male and 50 female teachers.

After encoding the classroom interaction, matrix tables were prepared for each observation. Thus 200 matrix tables were prepared and the behaviour-ratios were computed with the help of those matrix tables.

The flow-pattern-analysis was also attempted to observe the nature of behaviour of the elementary and secondary teachers. The pooled matrices were prepared and box-flow-diagrams were drawn for this purpose.

## ANALYSIS AND TREATMENT OF DATA

The main focus of the study was on the analysis of the difference of verbal interaction between the elementary and secondary teachers. Therefore 't'-test was employed for the significance of difference between these groups. The mean and standard deviations of behaviour ratios were computed for elementary and secondary teachers separately, and 't' value was computed

for analysing the difference between these two groups. The mean, S.D. and 't'-values have been computed and presented in Table 1.

Table 1 indicates that 't'-values for pupil talk (2.23), silence or confusion (5.51), pupil initiation ratio (3.96), teacher response ratio (4.17), teacher question ratio (4.24) and vicious circle (4.97) were found significant. It may be interpreted that the secondary teachers have greater silence/confusion, pupil-initiation-ratio, teacher-question-ratio and vicious circle than the elementary teachers. The elementary teachers have more pupil-talk and teacher-response-ratio than the secondary teachers.

TABLE 1  
MEAN, STANDARD DEVIATIONS AND 't'-VALUES FOR ELEMENTARY & SECONDARY TEACHERS FOR THEIR BEHAVIOUR RATIOS

Behaviour Ratio :	Elementary Teachers		Secondary Teachers		't'-Value
	Mean	S.D.	Mean	S.D.	
ITT	15.70	5.18	16.75	5.60	.963
DTT	35.74	6.179	35.87	7.09	.093
PT	39.725	7.32	36.39	7.46	2.23*
S/C	8.51	3.30	12.17	4.54	5.51**
TT	51.38	9.39	51.75	10.22	.133
I/D	0.46	0.22	0.51	0.52	.654
PIR	4.63	3.59	8.08	4.93	3.96**
TRR	52.78	11.51	43.79	9.73	4.17**
TQR	22.79	6.58	28.16	5.92	4.54**
CCR	37.05	7.93	36.04	7.82	1.13
SSR	47.19	10.61	49.51	11.38	1.036
PSSR	54.12	10.87	55.12	12.00	.435
TRR <sub>ss</sub>	58.72	14.02	57.60	14.81	.371
TQR <sub>ss</sub>	31.76	7.84	42.94	8.58	.707
V.C.	1.09	0.65	2.61	1.78	4.97**

\* .05 and \*\* .01 level of significance

It may also be observed from table that 't'-values for indirect influence (0.963), direct influence (.093), teacher-talk (0.136), I/D ratio (0.654), Content Cross ratio (0.435), instantaneous teacher-response-ratio (0.371) and instantaneous teacher-question-ratio (0.707) were not found significant even at .05 level of significance. It may be stated that there is no difference between the elementary and secondary teachers for their indirect influence, direct influence, I/D ratio, steady state ratio and instantaneous teacher response and question ratio.

An analysis of male and female elementary and secondary teachers was also attempted for studying the difference in their verbal interaction. The indirect and direct influence of secondary female teachers were found significantly greater than the elementary female teachers. The direct influence of secondary male teachers was obtained to be greater than elementary male teachers. It is interesting to note that the difference between elementary and secondary teachers was not found significant for their direct and indirect influence. Thus it may be stated that the level of teaching and sex-variable interact significantly with reference to the classroom verbal interaction.

#### *Analysis of Flow of Interaction for Elementary and Secondary Teachers*

The box-flow-diagrams of combined matrices were prepared separately for the primary and secondary teachers and have been shown in Fig. 1 and 2. The flow-pattern-analysis indicates that the steady state of pupil-talk of primary teachers is greater than that of the secondary teachers. The interchange of secondary teachers' classroom events appears to be higher than those of the primary teachers. The primary teachers appear to have larger transitions from pupil response to teacher direction, whereas secondary teachers seem to have greater transitions from teacher question to pupil talk response.

The pupil initiation in secondary teachers is greater than the elementary teachers. There are heavy transitions from initiation to teacher acceptance in secondary teachers, whereas in elementary teachers, there are more transitions from pupil-initiation to teacher-direction. It may be stated that acceptance of pupil-initiation by the secondary teachers is higher than that by the elementary teachers. In the state of silence or confusion, the secondary teachers ask questions to break the state of silence, whereas the elementary teachers give directions to break the state of silence or confusion. It is interesting to note that the transitions from pupil-talk and teachers' praise appear to be similar between the primary and secondary teachers.

#### *Findings*

On the basis of the above analysis and discussion of the results, the following inferences may be drawn.

- The level of teaching appears to be a valuable factor for classroom verbal interaction.

- The secondary teachers seem to have greater pupil-initiation, teacher-question, state of silence or confusion and vicious situation in their classroom teaching than the elementary teachers.
  - The elementary teachers appear to have more pupil-talk-response and teacher-response than the secondary teachers in their classroom interaction.
  - It seems that there is no difference between the elementary and secondary teachers in their direct and indirect influence, steady state situations, instantaneous teacher-response and question-ratios
- The findings of the study have been highlighted by the flow-pattern-analysis of behaviour of elementary and secondary teachers
- The interchange of classroom events appears to be greater in secondary teachers than the elementary teachers and the steady state situation, and vice versa
  - The secondary teachers seem to have greater pupil initiation than the elementary teachers and there are considerable transitions from pupil-initiation to teacher-acceptance, whereas the elementary teachers seem to have more transitions from pupil-initiation to teacher-direction.
  - In the state of silence or confusion, the secondary teachers ask questions, whereas the elementary teachers provide direction to break the state of silence or confusion
  - The elementary and secondary teachers appear to have approximately equal transitions from pupil-talk to praise.



### *Educational Implications of the Findings*

The findings of the study are valuable for explaining the classroom verbal interaction of the elementary and secondary teachers. The inferences of the study provides the empirical basis for explaining the nature of classroom teacher behaviour of elementary and secondary teachers in Indian conditions.

At primary level, the main emphasis is given on memory level of teaching, whereas at the secondary level, it is on the understanding level of teaching. Thus, the findings of the study also present the nature and structure of classroom verbal interaction and their flow patterns of behaviour at the memory and understanding level of teaching.

The findings of the study may also be useful for developing a theory of teaching, considering the nature of verbal interaction at different levels of teaching in situations prevailing in our classrooms.

The awareness of verbal interaction of elementary teachers and secondary

teachers may be helpful for the teacher-educators in improving the student-teachers' behaviour in classroom teaching. These inferences may add to the theory and practice of teacher-education programmes.

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# Psychometric Analysis of the Results Inferred from Internal and External Assessments

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*The research reported in the present paper was carried out with a view to demonstrate that when examination results pertaining to internal assessments, conducted independently, are compared with the help of mathematical techniques, drawing their rationales from different philosophies of measurement, then absolutely discrepant conclusions may be drawn with regard to adequacy of the results pertaining to two situations. Traditionally, an examination mark is regarded as an absolutely true measure of one's academic achievement, and on the basis of this theoretical assumption, results coming from two examination situations are compared in terms of successes and failures or classes and divisions, or just the differences in averages of marks coming from two situations, are put to tests of significance. All these methods draw their rationale from the theory of absolutism. But if theoretical assumptions underlying measurements of the psychic mechanisms, such as intelligence, industriousness, motivation, security-insecurity feelings, adjustment maladjustment, etc upon which an examination mark is genetically depending, is taken into consideration, then all these traditionally popular mathematical techniques become untenable and misleading since all these factors are only relatively true. The relatively true measures are, by definition, meaningful only in the perspective created by the measures pertaining to other objects or individuals evaluated under identical conditions of measurement.*

*Purpose of the Study*

Precisely speaking, the present investigation was carried out to verify if there was any kind of relationship between marks used by the class teacher in internal assessment and those obtained in the examination given by any external body. As indicated earlier, the study was taken up with the assumption that there would be significant relationship between two kinds of examination marks. The Hypothesis becomes meaningful when we know that the courses and syllabi from which examinations are to be conducted in two situations remain the same, and it is only the situations which change. With a view to make this point clearer, when examination marks pertaining to two situations are correlated, then, obviously, it is a case in which we are interested to study the phenomenon of test-retest reliability, the index of which, theoretically speaking, may be expected to be very high.

The second purpose of the study was to verify which of the two assessments, internal or external, was more valid. It is needless to say that from the view of content-coverage internal assessment is far superior, or it may be made superior more easily in comparison to external assessment, because the former is often based on more than one examination, whereas the latter is worked out from the performance in only one examination. Accepting this obvious fact regarding superiority of internal assessment over external assessment, validities of examination results pertaining to two situations have been adjudged against intelligence scores. Theoretically, academic achievement is dependent heavily on intelligence (or general mental ability). When Binet, the designer of the first test of intelligence, correlated test scores with that of achievement, it was implied that intelligence was regarded to be an independent factor of achievement. This kind of relationship between these two variables is not only theoretically plausible but empirically also it appears to have been established in a fool-proof manner. Rao (1963) quotes 835 studies and Stephens (1960) refers to 111 investigations which confirm that these two variables are significantly, positively correlated. Of course, the relationship under question has been reported to be ranging from .1 to .9 in these 946 studies. Actually, it is not the direction of relationship between intelligence and achievement (that is consistently reported to be positive) which is a controversial issue among theorists but it is the degree of correlation about which agreement is not forthcoming. The present study started with the assumption that performances in both internal and external examinations are likely to be found influenced equally by intelligence. And it is on the basis of such an assumption that genuineness of the results pertaining to two situations was planned to

be adjudged against intelligence test score an external criterion, the measurement of which is objective.

### *Delimitation of the Study*

Since evaluation of non-intellectual characteristics of human behaviour is very much subjective, only the examination marks in compulsory subjects pertaining to internal and external assessments were taken up in the study for analysis. Here it needs to be made clear that though some theorists are of the view that certain non-intellectual correlates of personality, such as industriousness, diligence, persistence, adjustment, n-Achievement, relevant interests, etc. should also be taken into consideration in the students' assessment, this study was delimited to the comparison of evaluations of academic achievements only. This kind of delimitation was thought advisable not only because assessments of such non-intellectual attributes are subjective but their assessment in external examinations is also not possible. Nobody can deny that performances on achievement tests are invariably influenced by these characteristics along with intelligence, the most potent single factor of academic achievement. Since achievement is mostly dependent on intelligence<sup>1</sup> and its measurement is comparatively objective and no previous study has challenged the positive nature of the relationship between the two variables, it was thought advisable to have some idea of genuineness of two kinds of assessments by using intelligence test score as an external criterion.

### *Method and Procedures*

As indicated earlier, marks in Punjabi, Hindi, English and mathematics obtained by an individual in his internal and external examinations were collected. Three kinds of treatments were given to these marks.

First, means and standard deviations of the marks were worked out subjectwise, separately for internal and external assessments, and then the differences in these means were put to t-test of significance. These results are presented in table 1.

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<sup>1</sup>Kelley (quoted by Rummers *et. al.* 1967, p. 101) and Wellington and Wellington (1968, p. 10) profess that intelligence and achievement tests cover about the same ground and it is the purpose of these two types of tests which differ Stephens (1956, p. 172) claims that intelligence and achievement are not different, the former refers to haphazard achievement and the latter points to specific achievement.

Second, in order to test genuineness of results, marks in each of the four subjects of curriculum were correlated with intelligence\* test scores separately for internal and external assessments and the differences in corresponding indices of 'r's' were put to t-test of significance, and these results are represented in table 2.

Third, in order to verify test-retest reliabilities of internal and external examinations, two kinds of correlational analyses were carried out. In one type of analysis, marks in each of the four subjects pertaining to internal assessment were correlated with corresponding marks in external assessment. In this study this kind of correlation has been taken to be the index of test-retest reliability. These results are presented in Table 3A. In the second type of correlational analysis composite\*\* scores, based on marks obtained in internal assessment in all the four subjects, were correlated with those based on marks in external assessment. These results are presented in Table 3 B. Since composite scores based on Z-scores are rarely used, it was thought desirable to present the data as used in the scatter-plot set up for working out inter-correlation.

### *Sample*

The research was completed on 70 boys studying in Class IX during 1973-74 session in a Govt. High School, situated in rural area in the district of Amritsar. These boys passed their annual examination given externally by the Punjab School Education Board, Chandigarh. The age of this group of students ranged from 14 to 16 years. The results are represented in the tables given below.

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\* Intelligence test score was based on the General Mental Ability Test designed by Jalota (1967).

\*\* For working out composite scores of internal and external assessments separately, marks in all the four subjects in their respective places were transformed linearly into Z-scores by employing the equation suggested by Lindquist and Bloomers (1960, P 156-170) and then the algebraic sums were worked out. And it is these algebraic sums which were used as indices of composite scores put in the scatter-plot given in Table 3B. Theoretically, it is doubtful whether marks pertaining to different subjects of curriculum fulfil conditions of additivity. In the present study, they have been added following the tradition prevailing in our country. However, in order to give equal weightage to all the four measures in the composite scores, the marks were converted into Z-scores. The question of giving equal weightage arose from the fact that the marks were pertaining to equally compulsory subjects. Moreover, statistical pre-requisites demanded that if the marks are to be added they must be linearly transformed into comparable units before putting these into composite scores

TABLE 1  
RESULTS OF T-TEST OF SIGNIFICANCE APPLIED TO DIFFERENCES IN  
MEANS WORKED OUT SUBJECTWISE FROM THE MARKS PERTAINING  
TO INTERNAL AND EXTERNAL ASSESSMENTS  
(N=70)

Subject of Study	Internal Ass		External Ass		T Value
	Means	S D.	Means	S.D.	
Punjabi	33.0	13.5	64.5	14.0	19.0
Hindi	22.0	8.0	38.7	12.5	10.8
English	22.6	11.0	44.7	10.0	12.8
Mathematics	23.0	13.0	45.0	11.0	12.7

TABLE 2  
INDICES OF CORRELATION AS MEASURES OF VALIDITY OF EXAMINATION  
MARKS TAKEN SUBJECTWISE FOR INTERNAL AND EXTERNAL  
ASSESSMENTS

Variable Correlated			Indices of 'r' for		t-value
			Internal Ass	External Ass	
Punjabi	Vs	Intelligence	.34	.31	23*
Hindi	Vs	Intelligence	.23	.27	29*
English	Vs	Intelligence	.37	.41	29*
Mathematics	Vs	Intelligence	.23	.24	96*

O B. Tabulated values of significance for 'r' 's' at .05 and .01 level are .23 and .30 respectively

\*Shows that t-value is insignificant

TABLE 3 A  
INDICES OF CORRELATION AS MEASURES OF RELIABILITY OF  
EXAMINATION MARKS TAKEN SUBJECTWISE FOR INTERNAL  
AND EXTERNAL ASSESSMENTS  
(N=70)

Variables Correlated			'r' value
Punjabi	Vs	Punjabi	.65**
Hindi	Vs	Hindi	.28*
English	Vs	English	.47**
Mathematics	Vs	Mathematics	.35**

\* Significant at .05 level

\*\* Significant at .01 level

TABLE 3 B

COMPUTATION OF 'R' BETWEEN COMPOSITE SCORES WORKED OUT  
WITH THE HELP OF Z-SCORES FOR INTERNAL & EXTERNAL ASSESSMENTS  
EXTERNAL ASSESSMENT

		Minus					Z <sub>zero</sub>	Plus									
		-6	-5	-4	-3	-2	-1	0	+1	+2	+3	+4	+5	+6	+7	+8	+9
INTERNAL ASSESSMENT	Plus	+8	+9											1		1	2
		+6	+7									2		1			3
		+4	+5							2		4					6
		+2	+3						3	4		1		2			10
	Z <sub>zero</sub>	+1	+0						2			1		1			7
		-1	-2						2	3		1					19
		-3	-4	2		4	9		8								21
		-5	-6			1	8		1								2
	Minus																
		2	16	18				10		9		9		5		1	70

r=.83

re=.91

N B For correcting the value of 'r' computed with the help of a scatter-plot, see Guilford (1965, P. 352-53).

re=refers to corrected value of r

### Interpretation of Results

The results represented in Table 1 clearly demonstrate that all the four differences in means are statistically significant. It means that in terms of differences in mean examination results, pertaining to internal and external Assessments, are not identical. The paradoxical situation which has been revealed by the findings of the present study is that all the four means for external assessment are significantly greater in comparison to those for internal assessment. It is generally believed that external examinations are held in order to check deterioration in academic standards. But the findings of the present study show that standards of external examinations are inferior in comparison to those maintained in internal examinations. It is too obvious to be explained that the poorer the standards of the examination papers, the better are the percentages of marks based on these papers.

The interpretation given in the preceding para will remain one-sided if two more possible causes of lopsidedness and unexpected direction in the results compared are not brought to light. First, psychologically speaking, students are more motivated and, hence, they put in more effort at the time of external examination, and this interpretation becomes plausible if it is kept in view that achievement in external examinations are valued more

by the society in comparison to their performances in internal examination. Secondly, since all sorts of employment are linked with one's certificate obtained in external exams, the problem of smuggling of undesirable material in these examinations and of using other underhand means on the part of the students also cannot be brushed aside; on the other hand this social vice is not so serious and acute in case of internally given tests. In fact, students cannot dare to copy in the exams given by their own teachers.

It seems desirable to mention here that there is no sense in comparing marks or percentages bases on marks or classes or divisions worked out from marks. Since in India an examination mark is, traditionally, regarded comparable from situation to situation, this kind of analysis was carried out with a view to demonstrate certain absurdities which invariably occur when marks are compared in their raw shape.

So far as the findings concerning genuineness of examination results are concerned, it may be noticed that two of the four indices of correlation pertaining to internal assessment (Table 2) are significant at .05 level and the remaining two at .01 level. More or less, the same trends of results are maintained in case of external assessment. Here also the results of the present study fail to support the general assumption that external evaluation is more genuine in comparison to internal assessment. None of the four results of t-tests of significance applied to the differences between corresponding values of correlation is statistically significant (Table 2, Col 4). It means that results based on internal and external assessments in the four subjects are, at their respective places, equally influenced by one's intelligence which is, both theoretically and empirically, the most potent factor of achievement. So far as the problem of explaining away the causes of low degree of correlations between subjectwise examination marks (pertaining to internal and external assessments taken separately) and intelligence test scores is concerned, it will suffice to say that reliabilities of these marks were very low and, theoretically speaking, when these will be improved, indices of relationship between achievement and intelligence will also go up.

Out of the four values of 'r', as the measures of test-retest reliability of examination marks (Table 3A), one value is significant at .05 level and the other three values are significant at .01 level. In fact, it is not the statistical significance of the index of reliability which matters but it is the degree of 'r' which counts. All the four degrees of 'r', ranging from .28 to .65, are not as high as they ought to be. One of the main purposes of this study was to demonstrate that indexes of test-retest reliability of examination results based on one test are not very much encouraging, irrespective of the fact whether tests are given by some internal or external agency. The causes of low reliability are not far to seek. The first causes of low

reliability lies in seeing the point that content validity of both internal and external assessment based on one examination in each case are very much questionable. Theoretically, when external and internal assessments in their respective places will be based on frequently given examinations in all the subjects separately, then such reliability indices will go up. Though the assertions made by the authors emanates from the scientific generalization which professes that repeated observations are more reliable in comparison to one observation, yet it will be a very interesting study if an investigation is designed to assess the relationship between internal and external assessments based on frequently given tests in the two situations separately.

Though, as it has already been indicated earlier, tradition of totalling of marks pertaining to different subjects is not based on any theoretically sound footing, the composite scores pertaining to internal and external assessments have been found to be correlated to the extent of .91 (Table 3B). This degree of correlation is as high as we may aspire to reach in genuine examinations even with the help of objective type tests.

### *Theoretical Discussion of Results*

Toward the end of introduction of this research problem, it was postulated that the results inferred from internally and externally given examinations would be identical and similar. With regard to the establishment of this proposed hypothesis, the evidence borne out by the empirical findings of the present investigation remains equivocal, rather contradictory: when mean differences based on internal and external assessments were put to 't' test of significance then the two results appeared to show significant discordance; On the other hand, when the results pertaining two situations were compared with the help of correlational techniques, the results based on the same data turned out to be having significant concordance, especially when they were inferred from the composite scores coming from two situations (Table 3 B). Accepting that systematization of information is the goal of science, two contradictory inferences may not be derived from the same data. It goes without saying that self-contradiction becomes laughable.

In order to explain the paradoxical situation created by the phenomena of discordance and concordance referred to in the preceding para, it needs to be recognised that the statistical comparison carried out with the help of 't' test of significance applied to the differences in mean scores pertaining to two testing programmes is misleading. But why? With a view to reach the answer to this question, the following assumptions, which the



statistical techniques under discussion fail to fulfil, need to be brought to light.

First, when the 't' test of significance is applied to compare differences in means worked out from the measures pertaining to two situations then it is done on the assumption that such measures are representing absolutely true phenomenon. Though none of the measures of factors underlying human behaviour may be regarded as absolutely true, some measures such as representing height and weight are so much static that if mean differences in them are put to 't' test of significance then inferences will not be misleading. But examination marks are representing just those performances which are mercurial in nature. In fact, they are dependent not only on permanent (intelligence, etc.) and static but also on dynamic (motivational) characteristics underlying human behaviour. Actually, the story of factors of an examination mark does not end with these two types of static and dynamic factors lying within the organism. But performance in examinations is also bound up with certain other immediately influencing factors, especially related to time, place, marker in essay tests and differences in standards of question papers given in different situations.

Second, the t-test of significance presupposes that the two measures which are to be compared have been obtained in two situations on the scale that is fulfilling the two basic conditions of a measuring tape : (i) that such a scale starts with an absolute zero, as the index of non-existence of the phenomenon which it purports to measure, and (ii) that a scale is fulfilling the condition of equal-appearing intervals or of uniform units. Here, it is too obvious to be explained that an examination mark, irrespective of the fact whether it is based on objective or essay type tests, is not a measure which is related to a scale fulfilling those two fundamental conditions. But instead of this, an examination mark is only relativistically true. The central idea of the philosophy of relativism is that an examination mark of an individual derives its meaningful and purposeful qualities from its relationship to the marks of other individuals who were examined together with him under similar conditions in the two situations. It is to be noticed that the system of correlational analysis is founded on the 'theory of relativism.' Seeking inspiration from this theory, when marks pertaining to two situations are kept separate in their true perspectives, as is done at the time of working out a bivariate scatter-plot needed in the computation of 'r', then influences of all the immediate factors, such as standards of question papers, the markers in essay examinations, the paper-setter in case of objective-type tests, and those related to time and place, are neutralised, or held constant and, consequently, genuine and expected concordance is established. On the other hand, 't' test of

significance derives its rationale from the theory of absolutism, according to which it is assumed that an examination mark is true even when it is taken out of the perspective created by the marks of all the examinees who take the test together. In fact, an examination mark has no legs to stand on independently; its meaningful existence is bound up with the presence of marks of other individuals. Now the question arises which of the two theoretical assumptions regarding the true nature of 'examination-mark' is sound. It goes without saying that only those theoretical assumptions are meaningful which are empirically verifiable. It may be remembered that the present study was designed to verify whether examination marks obtained in two situations are comparable or not. The correlation analysis supports the logically sound hypothesis whereas when marks are treated as if representing absolutely true phenomena then they become discrepant. Hence marks obtained in two situations ought to be regarded as only relativistically true.

It may be remembered here that it was also professed toward the end of introduction of the present thesis that no reform in the prevailing system of examination is possible without giving due recognition to the correlational identity operating in the results based on internal and external assessments. Keeping this purpose in view, it seems desirable to derive certain lessons from the findings of the present study, which may be helpful in reforming our examination system.

### *Pertinent Lessons*

The most pertinent lesson which may be derived from the results of the present study lies in seeing the fact that examination results are not to be reported in terms of percentages or "successes" and 'failures' or in terms of classes or divisions based on percentages of marks. All these techniques of reporting examination results are bound up with the theory of absolutism which has been discredited in the theoretical discussion of the findings of this study. More concretely, in the present study the average child, as the representative of his class, gets first division in Punjabi in external assessment whereas he may be dubbed as a third class student on the basis of his performances in internally given tests (Table 1). Similarly, if the two kinds of results pertaining to English are taken into consideration, then it may be said that an average child, as the representative of his class, fails in case of internal assessment, since he does not reach the level of 33% marks, whereas he is nearly a second class student in case of external assessment. Secondly, in order to put our examination system on a scientific footing, some method related to the correlational techniques

will have to be evolved. For this purpose, it will have to be accepted that marks are meaningful, and purposeful also, when they are put on an ordinal scale. In a layman's parlance this ordinal scale is known as merit list or simply, rank-ordering. When in any examination the number of examinees is too large to be put on an ordinal scale, then results may be reported with the help of mathematically defined grades. In this connection, one of the two courses may be adopted: (a) assuming that capacity to deal with abstract materials is normally distributed, five kinds of grades may be adopted. A-grade may be given to 7% 'top excellent' individuals, next 24% examinees in the scale of ordinariness may be awarded B-grade, and in this way next 38% may be put in C-grade, the D-grade may comprise next 24% individuals and the last 7% students may be given E-grades; (b) if we are not sure about the normal distribution of the ability in the measurement of which we are interested, then 20% individuals may be put in all the five categories according to their merit based on examination marks.

It will not make any difference if keeping the traditional method of putting the examinees into three categories is retained, and 33% examinees are given 'A' grades, 34% are put into the category of 'B' grades and the remaining 33% are labelled as 'C' grade students on the basis of their marks earned in the tests given. In the present study when top-excellent 23 students, out of the total of 70, were given A-grade on the basis of their composite marks earned in the internal assessment, then 19 out of these 23 happened to be A-grade students on the basis of their composite scores earned in external exams. It means that nearly 83% identity was operating in the results prepared independently in two situations. This type of identity will increase when grades will be based on more frequently given tests. But what makes the grading-system superior to the marking-system. The former helps in objectifying identity operating in the results inferred from two independent situations, whereas the latter fails to do so. Scientifically, objectivity refers to inter-observer agreement in assessing the same phenomenon. When this study has revealed that the results based on composite scores pertaining to two situations are highly correlated, it means that inter-observer agreement is available. But why this kind of agreement is not forthcoming when mean differences are compared? The truth is that when marks are changed into grades, some sort of decoding or decipherment takes place and the information capsuled in the numerical figures gets attached with individual differences upon which superiority-inferiority in examinations is actually depending. Moreover, adequacy of the grading system lies in seeing the fact that under the grading system no student fails.

*Practical Implications of the Findings*

The findings of the present study have very far-reaching practical implications. Subjectwise test-retest reliabilities and content-validities of examination marks need to be raised as high as possible. If index of perfect correlation is the figment of mathematical imagination, the degree of 0.99 may be demanded as the measure of reliability of an exam. mark in a particular subject of curriculum. Whether an examination mark is related to internal or external assessment, it must fulfil the condition of this much test-retest reliability. In order to reach this index of correlation, so many internal and external tests will have to be given in each subject of the curriculum. When every time each test will comprise new problems in the relevant subject, it is not only the reliability of an exam. mark which will go up, but the subjectwise content validity will also get raised.

It is to be noticed that content validity of an essay examination mark is very poor; and due to this reliabilities of subjectwise results have been found to be dubious in the present study. In some universities, for example, Punjabi University, Patiala, answer-books of postgraduate students are marked by two examiners independently. This is redundant, because this kind of treatment increases only the reader reliability. But it is useless to raise the reader-reliability of an examination mark without raising its content validity (Guilford, 1965, p. 103). Here, we are hinting towards a well known mathematical fact which claims that reliable test may not be valid, whereas a valid test is invariably and undoubtedly reliable. The validity of an achievement test must be assessed in terms of content of prescribed courses covered in any exam.

Now the question is that if results based on internal examinations become nearly perfectly valid and reliable on giving frequent tests, then, will there be any need of external examinations? This is a ticklish question. Obviously, if similar results may be arrived at from two assessments, as has been demonstrated in this study, in case of grades derived from composite scores, then one kind of assessment is redundant. Since internal assessment is an integral part of teaching and learning process, it should be preferred in comparison to external assessment. But if external examinations are abolished, psycho-physical inertia will overtake the students and teachers both, and consequently, standards of education will deteriorate further. In order to check that kind of deterioration, external examinations will have to be retained in one form or the other. The external examinations, it will not make any difference whether they are given by school education boards or universities, should be used to control quality of instructional standards and internally given examinations should be designed to serve the quantitative purposes.

In the proposed system, the external examinations will have to be given with a view to skim off cream of excellence. The percentage of the cream of excellence to be skimmed off every year may be determined through some legislation or enactment. Hypothetically, if one lakh students are enrolled in Class X in Punjab in all the high schools during 1974-75, and only one per cent cream is to be skimmed off by the Punjab School Education Board, then 1,000 top-excellent students may be truncated on the basis of their marks earned in the examination given by the Board and these 1,000 individuals may further be put into five types of grades. In this way only 200 students will get A-grade certificates. This number may be related to the needs of the society. College admissions should be based on the merit determined on the basis of these results. Such external examinations will be open to all but it is assumed that only the deserving will dare to take them. It can well be imagined how high will be the standard of such external examinations. Actually, the Board will have to raise the standard of its tests by way of necessity, otherwise it will not be possible to establish genuine and significant individual differences among the top-excellent students. Theoretically, if all the 1,000 top-most students, to be put into five grades, happen to get 100% (this situation may arise at any time in mathematics) marks in any externally given examination, then all the efforts of the Board as an examining body will end in fiasco. Because it will not be possible to put these 1,000 students into five types of grades. By the same token, it may be professed that if any school gives unnecessarily tough examination papers in its internal testing programmes then that examination will also go waste, because all will fail in that examination. Actually, no student should fail in any internal examination. One should be deemed to have failed only when one fails to actualize one's potential. With the help of the present-day psychological knowledge at our disposal, it is very difficult, if not impossible, to prove whether any individual has wasted his potential. As proposed above, if the grading system is adopted, no student will fail in internal assessment. Our proposal for elimination of the stigma of failure in internal examinations is psychologically, educationally, economically and socio-politically very sound. The second proposal regarding condition of issuing a fixed number of certificates in external examinations will stop undue inflation of degrees in the field of education.

### *Conclusion*

Keeping the results of the present investigation in view, it may be concluded that:

1. Information yielded by internal and external assessments are comparable (i e. significantly identical and similar), only when analysed with the help of correlational techniques or some other statistical methods derived from the correlational techniques such as grades.
2. If the results pertaining to these two types of assessments are compared in terms of mean differences then they appear to be discordant.

### *Suggestions*

The authors are of the view that:

1. Examination marks are just the interential data, and they should be treated as such
2. Purposes of external and internal examinations need to be delineated; the former may be designed to serve the qualitative purposes and the latter may be made to serve quantitative purposes of education.
3. Academic "failure" is a misleading concept. Its use should become an anathema, not only for research workers but also in the academic circles.

As regards the first suggestion, it may be realized that inferences in terms of grades are highly identical while comparisons in terms of marks reveal that discordance prevails in the two types of results. The second suggestion emerges from the truth, which is too obvious to be put to any research evidence, that it is not possible to examine adequately with a common test the group of students having vastly heterogeneous abilities: if tests are tailored to establish genuine differences in the top-excellent students, say among 20% of the total population, then 80% students will remain undifferentiated since they all will be getting zero marks; and if the papers are designed to suit the down-most 40 to 50% examinees, then most of the top-students will get the maximum possible scores and will remain undifferentiated.

The concept of 'academic failure' is not founded on any psychologically sound rationale. It needs to be redefined. One should be deemed to have failed only if one is wasting his potential and not because one fails to obtain the pre-determined score of 33%. The higher the standard of examination paper, the less number of students will get the arbitrarily imposed pass-mark; and the vice-versa is also true. Unlike the marks, the grades are immune to the influence of standard of the question paper, and nobody fails in the grading system.

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# Conservation of Liquid, Solid and Number

## A Cross-cultural Study of Indian and British Children

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*A small-scale study on conservation concepts of liquid, solid, and number was conducted on 25 British primary school-children. Their performance was compared with the same number of Indian children of comparable socio-economic group. The study reveals that Indian children, in general, develop basic conservation abilities slightly earlier than their British counterparts. But the behaviour pattern on conservation abilities is more anomalous for Indian children as compared to that of British children. The study clearly establishes that given the same type of educational environment and facilities as available to British children, Indian children, in general, will show better performance.*

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THE PROCESS of investigating the growth in intellectual development of children using Piaget's Clinical Technique is well known. Though the literature is full of studies on conservation concepts, very few cross-cultural studies are available in this field. It is because of the limitations of language and its proper interpretation. Beard (1963), Kellaghan (1965), and Okonji (1971) have tried to compare European and African children on Piagetian tests, but their results are inconclusive. Lloyd (1971) compared



the conservation performance of Nigerian and American subjects. His results indicated that Nigerian children show conservation operativity at the same age as Americans and that performance is a linear function of C.A. (Chronological Age). Another study by Laurendeau and Pinard (1962) revealed that a difference of as much as three years exists between children in Martinique and Montreal in the age of attainment of certain levels of development, even though the school curriculum is very similar in both the areas. According to Lovell (1971):

"In some less developed societies, children are a little behind Western children on conservation task, but they fall much further behind on tasks which involve more flexible concrete, or formal operational thought."

Dodwell (1960) showed that the children from rural background or lower economic status do more poorly in tests of number concepts. The author is not aware of any such study ever attempted with Indian children. Sudha Sharma (1974) conducted a study on conservation concepts on primary school children in Bhopal city. The author was actively associated in this study of Mrs. Sharma in all its stages. As such he tried to conduct a similar study on British children from Geoffrey Field Junior School, Exbourne Road, Reading, during his one year stay there under Commonwealth Education Fellowship. A small sample of 25 children from each study who are comparable in their socio-economic status have been selected for the purpose of this paper.

### Procedure

Piagetian tests (Flavell, 1963, Frogelman, 1970) of conservation of liquid, solid and number were administered to individual children. Four different tasks were administered for each concept using clinical method (Unesco, 1974). The child was considered conserver if he was successful on at least three tasks. The age-wise and sex-wise break-up of British children are given in Table 1.

TABLE 1  
AGE AND SEX-WISE BREAK-UP OF BRITISH CHILDREN

Age (in yrs.)	(6-7)	(7-8)	(8-9)	(9-10)	(10-11)	Total
Boys	3	3	2	3	2	13
Girls	2	2	3	2	3	12
Total	5	5	5	5	5	25

The age and sex-wise break-up of Indian children selected from Sudha Sharma's study (1974) are given in Table 2.

TABLE 2  
AGE AND SEX-WISE BREAK-UP OF INDIAN CHILDREN

<i>Age (in yrs)</i>	(6—7)	(7—8)	(8—9)	(9—10)	(10—11)	<i>Total</i>
Boys	3	3	2	2	2	13
Girls	2	2	3	3	3	12
Total	5	5	5	5	5	25

### *Analysis of data*

The performance of Indian and British children on liquid tasks are represented in Fig. 1. The bar diagrams represent the performance of the group as a whole and sex-wise as well. It is clear from the figure that Indian children show better results in the age-groups 6-7, 8-9, and 9-10, whereas in the age-group 7-8 and 10-11 they are equal to their British counterparts.

In the sex-wise analysis we find that Indian boys do better in the age-group 9-10 only. In the other groups they are equal to British boys. The performance of Indian girls is better in the age-groups 6-7 and 8-9, and they are equal to their British peers in other age-groups.

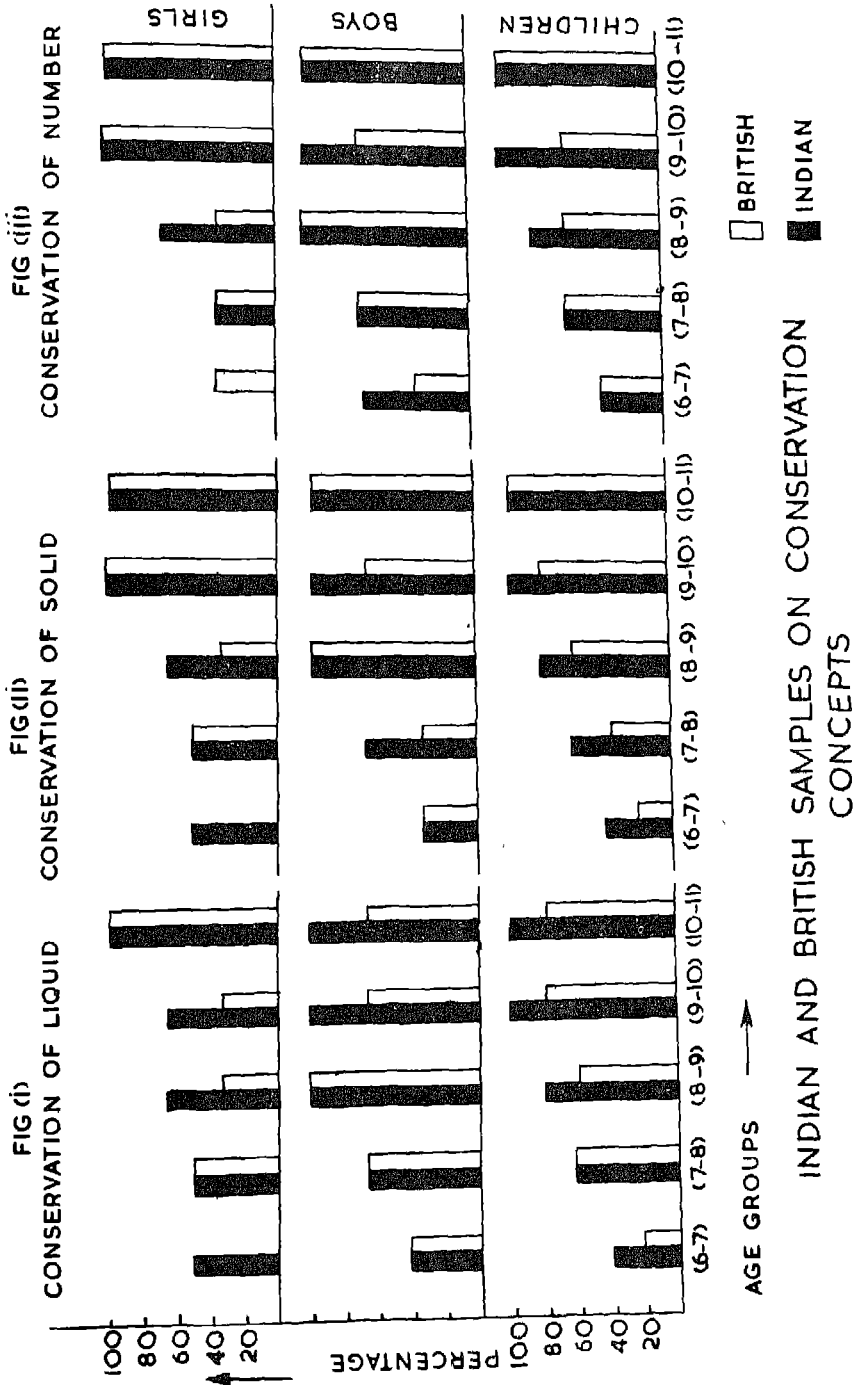
Fig. 2 represents the analysis on solid tasks. Here, again, we find that Indian children show more maturity than their British counterparts. Even in the sex-wise analysis Indian boys perform better in the age-groups 7-8 and 9-10 and Indian girls in the age-groups 6-7 and 8-9, and in other age-groups they are equally good as British boys and girls.

Fig. 3 shows the performance of two groups on number tests. Here, again, Indian children show better results in the age-groups 8-9 and 9-10, and Indian boys demonstrate better performance in the age-groups 6-7 and 9-10. Indian girls show poor results in the age group 6-7 but their performance becomes better in the age-group 8-9.

On the basis of above analysis we can say that the overall performance of Indian children in these three concepts of conservation are better than their British peer-groups within the limitations of this study.

### *Behaviour pattern of conservation abilities*

These data were further examined to explore the pattern of conservation



abilities exhibited by Indian and British children. The following five conservation patterns were investigated:

1. Conserving no task at all (0,0,0)—Pattern 1.
2. Conserving only liquid tasks (1,0,0)—Pattern 2
3. Conserving only liquid and solid task (1,1,0)—Pattern 3.
4. Conserving all the three tasks (1,1,1)—Pattern 4.
5. Any other conservation pattern—Pattern 5.

Table 3 shows the number and percentage of children showing various conservation patterns.

TABLE 3 (a)  
PATTERN OF COSENRVATION ABILITIES REVEALED BY INDIAN CHILDREN

Pattern	Age in Years				
	[6-7] N%	[7-8] N%	[8-9] N%	[9-10] N%	[10-11] N%
1	2 40	1 20	0 00	0 00	0 00
2	0 00	0 00	0 00	0 00	0 00
3	1 20	0 00	1 20	0 00	0 00
4	0 00	2 40	2 40	5 100	5 100
5	2 40	2 40	2 40	0 00	0 00

TABLE 3 (b)  
FOR BRITISH CHILDREN

Pattern	Age in Years				
	[6-7] N%	[7-8] N%	[8-9] N%	[9-10] N%	[10-11] N%
1	3 60	2 40	2 40	1 20	0 00
2	0 00	0 00	0 00	0 00	0 00
3	0 90	0 00	0 00	1 20	0 00
4	1 20	2 40	3 60	3 60	5 100
5	1 20	1 20	0 00	0 00	0 00

Pattern 1 (0,0,0) is the highest in early years and vanishes in the higher age-groups. In the Indian sample, it vanishes at (8-9) but in the British sample it continues up to (9-10) and disappears only in the last age-group (10-11). The percentage of children in various age-groups is also higher in the British sample.

Pattern 2 is not visible in any sample and Pattern 3 shows some anomalous behaviour in both samples. In Pattern 4 (1,1,1) or conserving all the three concepts, the British children show better results because at (6-7) none in the Indian group shows this pattern whereas in the British sample 20% show it. Similarly, at (8-9) it is observed in 60% British children as compared to 40% in the Indian group. But at (9-10) Indian children show better performance. This pattern is observed in 100% Indian sample at this age-group as compared to 60% of the British sample. Pattern 5, which is an anomalous pattern, is visible more in the Indian children than in the British ones.

Let us now look at the overall conservation abilities of these children ignoring their age-groups and sex differences. Table (a) and (b) show this behaviour

TABLE 4 (a)

NUMBER OF CHILDREN (OVERALL) REVEALING CONSERVATION ABILITIES

<i>Children</i>	<i>Liquid</i>		<i>Solid</i>		<i>Number</i>	
	N%		N%		N%	
Indian	19	76	19	76	19	76
British	16	64	15	60	19	64

It shows that the overall performance of the Indian children is better in these concepts than their British counterparts.

TABLE 4 (b)

PATTERNS OF CONSERVATION ABILITIES SHOWN BY THE GROUP  
AS A WHOLE

<i>Children</i>	<i>Pattern 1</i>		<i>Pattern 2</i>		<i>Pattern 3</i>		<i>Pattern 4</i>		<i>Pattern 5</i>	
	N%		N%		N%		N%		N%	
Indian	3	12	0	00	2	8	14	56	6	24
British	8	32	0	00	1	4	14	56	3	12

This table shows very clearly that whereas Pattern 1 is visible in more British children, Pattern 5 is shown by more Indian children. Pattern 4, which is a decisive pattern, is shown equally by both the groups.

*Results and Discussion*

The analysis clearly shows that the Indian children develop basic conservation abilities slightly earlier than their British counterparts. Since the conservation abilities have direct bearing on the intellectual development of the child we can say that within the same age-group the intellectual growth of Indian children, in general, is better than their British peers. This means that if we are able to provide the educational and environmental opportunities to our children comparable to that available to the British children, the Indian children are expected to show better results.

This study also provides an idea about the thought processes in the young children. According to Piaget the mind of the child often works in ways that are radically different from those of the adults and quite unsuspected by him. The ways and reasonings that seem quite obvious to the adults are not obvious to the child. The child does not make random intelligible mistakes, but he operates according to a logic which is consistent but different from that of adults. He is not convinced by being told that he is wrong, nor by merely seeing evidence that contradicts his thinking. What he really needs to be convinced is the data to work upon, to transform it and his own discoveries *en route*. The result is that many people, including parents and teachers, misunderstand the child and underestimate or overestimate him. Due to this ignorance sometimes their behaviour is quite unreasonable towards the child. For this reason it is important for the adults, especially for parents and teachers, to be familiar with Piagetian work. This small study is an attempt in this direction. Lovell (1962) supports this argument in the following words:

My experience leads me to believe that all teachers in training should have the opportunity of observing children undertaking some of the Piaget-type experiments.

This will certainly help them to understand the scope and limitations of children's thinking processes. This study, in a limited sense, tries to fulfil this aim by providing some information on this aspect.

*Limitations of Study*

The results of the present study are in no way the final word on the performance of the Indian and British children. It is just an attempt to see how these children really tackle the problems when provoked to think. The following are some of the main limitations of this study:

- 1 The samples are too small to draw any definite conclusion. The study needs to be enlarged in scope.
2. Though the author was actively associated with both the groups in collecting the data, the presence of another experimenter with the Indian group may have modified their responses to some extent.
3. Though the help of an Englishman was taken, to some extent, the author's own pronunciation and accent in asking questions to the British children might have had an effect on their responses

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# Control as an Aspect of Group Leadership in Classrooms

## A Review of Research

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It is well known that all teachers, and especially beginning teachers, attribute considerable importance to the problem of maintaining order in their classrooms (Amsterdam, 1957; Corsini & Howard, 1964; Jackson, 1968; Morrison & McIntyre, 1969). For many years, psychologists and educators alike have complained that researchers have devoted remarkably little attention to such an important topic, and that teachers have had no foundation other than intuition, personal experience, or anecdotal accounts on which to base decisions about discipline in their classrooms (Ladd, 1958a, 1958b, Sheviakov & Redl, 1956). Journals written for classroom teachers do contain numerous articles describing specific techniques of discipline that individual teachers have found effective, and Kujoth (1970) has provided a collection of such pragmatically-oriented articles. Until recently, however, specific research evidence has been scanty.

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This situation seems to be changing somewhat. In the past fifteen years, increasing attention has been devoted to methods for the observational study of classroom groups. Reviews by Withall (1960), Ryans (1963a, 1963b), Boyd and De Vault (1966), Biddle (1967), and Rosenshine (1970b) have described the extensive assortment of recently developed procedures for recording classroom interactions; and one review estimates that over 400 such observational systems are now available (Rosenhine & Furst, 1971). Many of the observational systems have categories relevant to teacher management or teacher influence in the classroom, so that the amount of data relevant to teacher control shows prospects of increasing.

The increase in the availability of data has brought with it new problems, however. These are the problems of how to collect the data systematically and how to organize the data into a context. The currently available research on classroom control has been largely unrelated to a theory of behavior in classrooms or in groups. Such questions as what is controlled or managed in classrooms or for what purpose is control exerted have not been carefully considered. Some writers have begun to emphasize the possibilities inherent in viewing the classroom as a social system (Getzels & Thelen, 1960, Jenkins, 1960; Trow, Zander, Morse & Jenkins, 1950). Although this view suggests that teacher control might profitably be considered in terms of the teacher's exercise of authority in her position as delegated leader of the classroom group, little of the current research originates from such a point of view.

This paper will use concepts from social systems theory and research on aspects of leadership behaviour in an attempt to delineate the meaning of control as applied to classrooms and teachers. A major problem with the concept of control as currently used is that it has too many overtones and connotations. In order for the term control to have useful meaning it must be clearly differentiated from other terms having similar but not identical meanings.

Confusion surrounding the term control stems in part from early research on authoritarian vs. democratic leadership styles. Therefore, this review proceeds as follows: First, the early research is briefly reviewed and the confounding of concepts that can be found in it is specified. Then, recent theory on social system functioning and research on the exercise of authority are used to delineate the concept of control and to clarify its relationship to other terms. Finally, literature relevant to control in classrooms as broadly conceived is reviewed. In the review, particular attention is paid to the measures used to define control and how those measures relate to a more delineated definition of control.

## EARLY RESEARCH ON LEADERSHIP AND CONTROL

The first research to be reviewed here concerned neither teachers nor classrooms; it was about adult leadership styles in groups of boys. The classic study by Lewin, Lippitt, and White on authoritarian, democratic, and *laissez-faire* leadership (Lewin, Lippitt, & White, 1939, White & Lippitt, 1968) has been widely reviewed (Anderson, 1959; Hartup, 1970; Wallen & Travers, 1963), and so will be described here only briefly. The relevance of this study to the present review is that it touched off a large number of studies using the dimension of authoritarian vs. democratic leadership (which in the classroom research was frequently described as teacher-centered *vs.* learner-centered instruction) that served to confound the concept of control. The range of subsequent studies is reviewed in Anderson (1959).

The researches created small (five-member) groups of 11-year-old boys, each of which had an adult leader. The leader switched the groups every several weeks so that each group experienced an authoritarian, a democratic, and a *laissez-faire* leader. In addition, each of the four adult leaders role-played more than one of the leadership styles, thus allowing the experimenters to control for leader personality and to observe changes within groups as leaders switched. The *laissez-faire* style required the leader to distance himself from group interactions, to make few suggestions, to participate only when specifically asked, and even then to do so perfunctorily. The democratic style involved encouraging group members to make decisions and to participate in planning; the democratic leader tried to act as a moderator in discussions. The leader in the authoritarian style allowed the group no freedom of choice about activities and frequently specified in detail how projects were to be carried out. In addition, the authoritarian leader makes "personalized" comments, frequently critical, about members' accomplishments.

The authors measured both aggressive behaviour and productive behaviour. The *laissez-faire* leadership consistently produced the most aggression and the least productivity, while the democratic leadership produced medium amounts of each. The reaction to authoritarian leadership was more complex in that groups showed one of two reactions. In the rebellious reaction, the group did about as much work as the democratic groups, with more aggression. The other reaction was for the group to submit to authority, and to produce more work and exhibit less aggression than any other group. That the groups with authoritarian leadership were responding to the control exerted by the leader was demonstrated by having each leader leave the room briefly. At these times the productive behaviour of the authoritarian-led groups decreased

significantly more than that of the democratic-led groups; the productive behaviour of groups with *laissez-faire* leadership actually increased at such times.

A major problem with this research was that the defined leadership conditions confounded at least two dimensions of leadership behaviour: control and emotional responsiveness. The authoritarian leader not only specified completely what was to be done, he was also distant and occasionally abrupt or sarcastic. The democratic leader not only encouraged participation in the decision-making, he was open and friendly.

At about the time Lewin's group was studying the effects of experimentally created social climates, Anderson and his colleagues were developing methods for the naturalistic study of the effects of dominative *vs.* integrative behaviour. After beginning with observations of dominating behaviour in the peer relations of kindergarten children (Anderson, 1939), they went on to consider the effects in classrooms of the teacher behaviour that varied on this dimension (Anderson and H.M. Brewer, 1945, Anderson and J. E. Brewer, 1946; Anderson, J.E. Brewer and Reed, 1946; Anderson, 1943). In their conceptual definitions, the authors described dominance as an imposed limitation or restriction on individual children's behaviour. The hypothesis was that dominance on the teacher's part produced less involvement in work on the part of children than did integrative behaviour. However, their operational definitions (as represented by the categories on their behaviour checklists) contained precisely the kind of confounding contained in the leadership patterns in Lewin, Lippitt, and White (1939). The domination also included rejection, disapproval or criticism on the part of the teacher. Some behaviours scored dominative were: determining a detail of activity, relocating a child's seat, and disapproval or blame. The integrative behaviours, on the other hand, included: approval, sympathy, granting permission to a child.

The series of studies was impressive for the extensive observations of children (each child was observed for two hours worth of non-consecutive five-minute periods) but disappointing for the small number of classrooms used. The most extensive study, based on classes taught by four teachers, compared the classrooms of two second-grade teachers, one of whom had been identified as more integrative. Child behaviour in the classroom of the more integrative teacher was found to include less distraction, more conformity to teacher expectations and more spontaneous, voluntary participation. This effect was stable over two years of observation. Further evidence that the child behaviour was influenced by the classroom environment was obtained by showing that correlations between the behaviour of the same children in the second and third grades were low and non-significant.

## THE CONCEPT OF CONTROL

In the studies cited above, the dimension of leader restrictiveness or permissiveness was completely confounded with the dimension of leader responsiveness or warmth. In fact, on a logical basis at least three dimensions of leader behaviour can be distinguished that might be incorporated under the concept of control. They are: (1) the way in which the teacher responds to deviant behaviour, (2) the characteristics of the teacher's emotional relationship with the class, and (3) the way in which the teacher structures the classroom, i.e. the extent to which the teacher imposes limits on the freedom of movement or freedom of choice of children in the classroom. It is the thesis of this review that the understanding of classroom interactions between teachers and students will remain obscure if all three of the described dimensions are encompassed in the term "control". It is the further thesis that control is most aptly applied as a term for the third dimension specified above.

The social systems theory (Miller and Rice, 1967; Rice, 1965) provides a framework for clearly specifying the concept of control. In the social systems theory the term control refers specifically to the manager's (or leader's) control of transactions across internal or external boundaries of the system. The concept of boundary is used to analyse interactions between and within groups. The boundaries, which can be physical but need not be, occur at points of discontinuity in space, time, or behaviour. A discontinuity is a boundary if there is control or regulation of transactions across it. It is an important function of the management of an organization to regulate both the transactions across the boundaries between the organization and other social systems in its environment, and also the transactions across the boundaries between the sub-systems of the organization itself. All systems can be thought of as having a task that requires taking in materials from the environment, processing them, and distributing a product. For the task to be accomplished effectively, the management of the system must regulate the flow of the material as it passes across the boundaries from one processing system to the next. That is, the operations required for doing the task must be coordinated.

The classroom can be thought of as a complex social system in which each child is a subsystem and the teacher is the manager. The task of the classroom group is the production of learning among its members. As the manager of the classroom group the teacher has to decide how to control the transactions among group members so that the task of learning is accomplished effectively and efficiently. In Getzels' (1968) analysis, effectiveness and efficiency are two aspects of the functioning of educational settings as social systems. Effectiveness refers to the success of an organization or group in achieving its institutional goals. The efficiency of a

group, on the other hand, refers to how satisfied the group members are in the role they perform in meeting institutional goals

A classroom with high control of the boundaries would be one in which the transactions among students and between a student and the rest of the class would be carefully regulated by the teacher. In such a classroom, for example, children would not talk to other children or leave their seats to go to another part of the classroom or make a statement to the entire class unless the teacher specifically initiated or approved such actions. In a classroom with low boundary control, on the other hand, children would be free to initiate conversations with other children and would have free access to facilities in the room. With regard to the sequence of work tasks, the teacher in a classroom with high boundary control would specify in detail the task to be done and the time when it was to be done. In a classroom where the time boundary was less controlled, children would have more choice when to do their work. The teacher must also make some decisions about the relationship between the classroom and the larger system of the school. In particular, the teacher must decide about the conditions under which children can leave the classroom; whether children can decide to leave the room themselves (low boundary control), whether they must first seek permission, or whether they may leave only at times indicated by the teacher (high boundary control). In general, then, the question of boundary control in classrooms relates to the degree of constraint on children with regard to their use of time and space in the classroom and with regard to the kinds of interactions they can have with other members of the class.

Decisions about boundary control ought to be made in terms of organizational effectiveness (Miller & Rice, 1967). The manager of a system must decide how the boundaries among the parts of the system are to be controlled so that the task of the system is best accomplished. We have specified the task of the classroom group as the production of learning among its members. The teacher must make a judgement, then, either implicitly or explicitly, about how much regulation of the transactions between each student and the other components of the classroom is necessary to produce the most effective learning. A decision to maintain high control over the boundaries would imply that transactions across boundaries were potentially distracting and that maximum learning occurred when children individually attended to the material specified by the teacher. A decision in favour of low boundary control would imply that unregulated transactions across boundaries were potentially productive of work, and that learning was facilitated by free access to a variety of resources, including other students

Decisions about boundary control in the classroom have implications for efficiency as well as for effectiveness. Individuals have personal needs which

must be satisfied in the context of interpersonal relationships. The boundary control decisions that regulate the interaction between a child and his environment will affect the extent to which the child can satisfy his needs. Thus, the teachers must also make decisions about how the children's needs will be satisfied in the classroom and about how the goals of personal satisfaction are related to the goals of task performance.

Using the concept of control supplied by the social systems theory, it is possible to determine how other concepts sometimes used in the description or analysis of the teacher behaviour relate to this concept of control. The terms such as "permissive" or "non-directive" could well be applied to the teachers who kept low control over the classroom boundaries; whereas, opposite terms such as "directive" could be applied to the teachers who maintained high control. In other words, permissive, non-directive or low-controlling teachers would be those who permitted the children in the classroom to exercise relatively high freedom of choice, freedom of movement, and participation in the decision-making; whereas, directive or high-controlling teachers would be those who kept a high proportion of decision-making power to themselves.

The term "structure" deserves special consideration. The present author recommends that structure should not be used as a synonym for control, as this usage easily leads to confusion. The potential confusion involves different possible definitions for endpoints of a continuum of "structure." It is easy to imagine that a highly structured classroom would be one with high boundary control, as described above. However, it is not clear that low control of the boundaries would imply low structure. It is quite possible to imagine a classroom in which the structure was highly explicit, in that the areas of authority and decision-making delegated to the children were clearly defined; but in which moment-to-moment control over the boundaries by the teacher was low since many decisions were delegated to the children. For this reason it is suggested that the term control, as precisely defined, be used in preference to the term structure.

There is a crucial distinction to be made between the teacher control of the classroom boundaries and the emotional responsiveness of a teacher in the classroom (Smith & Hudgins, 1967; Wallen & Travers, 1963). This is the crucial distinction often overlooked in prior research on adult-child interactions. The dimension of teacher emotional responsiveness has often been labelled "warmth" or "punitiveness." This variable could be measured either by direct observation of the teacher or by asking students in the class to report on teacher behaviour. Though it has often been assumed that high permissiveness and high warmth are perfectly correlated, this is by no means necessarily the case.

A further distinction that must be made is between the two dimensions

of the teacher behaviour outlined above: (1) degree of control over classroom boundaries and (2) degree of warmth or responsiveness) and the dimension of classroom climate. The classroom climate relates to Getzels' (1968) concept of the efficiency of a classroom group, that is, to the degree of satisfaction or of other emotional or affective reactions of class members. The classroom climate could be measured by observation but is perhaps perhaps best measured by asking students questions designed to find out about the social environment of learning in the classroom (Walberg, 1969, Walberg & Ahlgren, 1970). It would not be possible on an *a priori* basis to measure the classroom climate by measuring the teacher behaviour or attitudes. The question of what sort of teacher behaviour leads to what sort of classroom climate is an empirical one. It seems likely that both degree of teacher boundary control and the degree of teacher warmth would have influence on the classroom climate.

The argument that the teacher leadership in the classroom will be more accurately described and understood when the two dimensions of control and warmth are clearly distinguished is supported by research in other areas related to the exercise of authority. A prominent instrument for assessing leadership patterns in groups and organizations is the Leader Behaviour Description Questionnaire (Stogdill & Coons, 1957). This instrument yields scores on two factors: (1) the leader's initiation of structure and (2) the leader's consideration. Bierman's (1969) review of aspects of interpersonal facilitation in psychotherapy, identified two major dimensions called activity and acceptance. Recent work on parent-child interactions has emphasized the importance of two factors for effective child-rearing: (1) control of child activities by setting parental standards and (2) warmth and involvement (Reiss, 1972). Similar dimensions have been called (1) restrictiveness *vs.* permissiveness and (2) warmth *vs.* hostility (Becker, 1964). In each case the dimensions described are at least roughly analogous to control of the boundaries and emotional responsiveness.

To this point this review has concentrated on distinguishing among three dimensions that might be encompassed under the concept of control: (1) specific teacher response to deviance, (2) the teacher's emotional relationship with the class, and (3) the teacher's control over the classroom boundaries. It has been suggested that the term control be restricted to the latter dimension. There are two more sets of distinctions that must be made before presenting relevant studies in detail: (1) distinctions among types of measurement techniques and (2) distinctions among types of criterion variables.

There have been three general types of measurement techniques used to assess the degree of teacher control: questionnaires, rating scales, and category systems of observation. The reviewers of classroom observation



procedures have begun to emphasize the distinction between high inference and low inference observational measures (Biddle, 1964, Rosenshine, 1970a, 1970b; Rosenshine & Furst, 1971). A high inference measure is the one in which an observer must attach a label to a set of behaviours after observing them. The bipolar adjective rating scales completed either during or after observation periods are the most frequent examples of this kind of measurement. The label attached can be either a summary of the behaviour (warm, friendly *vs* cold, aloof) or an evaluation of it (effective *vs* ineffective). A low inference measure is the one in which behaviours are coded into one of a limited set of pre-arranged categories as they occur. The amount of inference required in a category system can vary according to the behavioural specificity of the categories. Observers have been asked to record behaviours varying in specificity from "teacher smiles" (Harrington, 1955) to "teacher accepts or understands child" (Withall, 1949). High inference variables have numerous problems (Rosenhine, 1970b), not the least of which is the difficulty in translating findings based on them into specific behavioural descriptions (i.e. if it is found that "warm" teachers are liked better, how do you tell a teacher to act more "warmly"?). Low inference variables, on the other hand, usually must be based on highly specific and discrete behaviours in order to be reliably measured. This sometimes makes it difficult to interpret the significance of such variables. (It is not immediately evident, for example, what difference it makes for one teacher to score higher than another on the variable "talks to entire class"). Though much of the research based on high inference rating scales has been held to be poor and unproductive (Biddle, 1964), Rosenshine (1970b) has recently cited a few studies in which rating scale variables were as reliable as category variables and actually predicted better to criteria of student achievement.

The other distinction concerns the choice of criterion measures. The criterion measures are chosen to assess either the effectiveness or the efficiency of a classroom or a teaching procedure. Measures of efficiency usually assess aspects of the classroom climate: degree of satisfaction, amount of anxiety, etc. Measures of effectiveness can be divided into process and outcome variables. The most typical outcome measure in educational research is a standardized achievement test score. Process measures of effectiveness relate to the work of the group but not directly to ultimate task performance, e.g. proportion of the time spent on work or the number of teacher-student interactions.

As specific studies are presented in this paper, an attempt will be made to place them in the context of these three dimensions: (1) conception of control as reflected in the measure chosen, (2) the type of measure used, and (3) the type of criterion variable.

*Empirical Relationships between Control and Warmth*

This review has so far emphasized the logical distinction between control of the boundaries and emotional responsiveness on the part of the teacher. What empirical evidence is there that these dimensions are in fact distinct? Several independently done factor-analytic studies of classroom interaction have been remarkably consistent in identifying three primary factors that can be thought of as representing (1) teacher control, (2) teacher warmth, and (3) teacher enthusiasm (Rosenshine, 1970a, has reviewed literature relevant to this last factor).

Among Ryans' numerous measures of teacher characteristics (1952, 1960) was a bipolar adjective rating scale (a high-inference observational procedure according to the scheme described above). His factor analysis of the rating scales revealed three correlated factors which he labelled (1) Responsible, businesslike *vs.* Unplanned, unsystematic, (2) Kindly, warm *vs.* Aloof, cold; and (3) Stimulating, imaginative *vs.* Dull, routine. He also developed questionnaire scales that predicted to each factor

Harvey, Prather, White, and Hoffmeister (1968) used rating scales similar to Ryans' for both teacher and child behaviours in kindergarten and the first-grade classrooms. Their cluster-analysis produced dimensions of (1) Dictatorialness, (2) Punitiveness, and (3) Resourcefulness. These might be conceived of as being similar to Ryans' factors with differences in labels stemming from different value orientations.

In Solomon's studies of college teaching (Solomon, 1966, Solomon, Rosenberg, & Bezdek, 1964) several orthogonal factors were derived from data comprising both observer ratings of teachers and student responses to questionnaires. Among the four major ones were factors labelled: (1) Control, factual emphasis *vs.* permissive; (2) Criticism, hostility *vs.* tolerance; and (3) Energy and communication *vs.* lethargy.

Wallen, Travers, Reid and Wodtke (1963) had observers assign a rating to 77 elementary school teachers on 24 bipolar adjectives or phrases by means of a *Q* sort. The *Q* sort data were then factor-analysed to yield orthogonal factors, two of which were called: (1) Cold, controlling *vs.* Warm, permissive and (2) Vigorous, dynamic *vs.* Dull, quiet. This is the only factor-analytic study in which items for control and items for warmth is loaded on the same factor. The primary control items on the factor seem to be congruent with the precise definition of control offered here, but there were only two of them: "delegates much authority" and "permits a great variety of activities." This may only serve to show that the observers using global ratings after the actual observation sessions are not able to discriminate warmth from control.

Medley and Mitzel's Observation Schedule and Record (OScAR; Medley

& Mitzel, 1958, 1963) is based not on the adjective rating scales but on a complex and varied category system of observation. Factor analysis of this instrument has shown three orthogonal factors (Medley & Mitzel, 1959): (1) Social organization, (2) Emotional climate (warm *vs.* hostile), and (3) Verbal emphasis (which refers to reliance on verbal interchange as opposed to the use of a variety of media). Social organization appears to be related to the concept of control as defined here, since a high score represents pupil autonomy and independent work.

Christensen's (1960) study was neither observational nor factor analytic. He devised questionnaire scales for permissiveness and warmth and found that the rank correlation between them was .39. This was not significant in his small sample of 10 classrooms.

Comparisons among the studies just cited must be made tentatively. The studies were based on different kinds of data. In some cases the factors derived were correlated, in other cases they were orthogonal. Factor names are of course not intrinsic to factor items, and differences in emphasis in factor names might be related to values held by the researcher. However, it does seem reasonable to conclude from the above studies that, though control and warmth may be correlated dimensions, they are nonetheless distinguishable ones.

#### STUDIES ON THE EFFECTS OF TEACHER CONTROL

It is the author's opinion that the central problem for research on teacher control in classrooms at present involves determining a circumscribed and agreed-upon definition of control, and then finding measures to operationalize the definition. Numerous variables currently in use in educational research relate generally to the topic of classroom control, but lack of agreement on variable definition makes comparison of findings difficult. Because of this central problem, studies in this review are arranged in terms of how the concept of control is operationalized, rather than in terms of relationships with criterion variables.

##### *Findings from Factor-Analytic Studies*

As a criterion variable Ryans used a composite measure of pupil productivity based on a few pupil-behaviour rating items. In terms of the framework for categorizing criterion variables described above, this is a process variable relating to effectiveness. He found that in the secondary school classrooms none of his three factors related to productivity, but in

the elementary school classrooms all the three factors correlated about .8 with the criterion (Ryans, 1961b, 1964). The correlations of his questionnaire estimates of the three behaviour factors were lower ( $r$  about .3), but still significant due to the large sample (Ryans, 1961a).

Harvey *et al.* (1968) used factor-analysed ratings of pupil behaviour as their criteria. They found that both dictatorialness and punitiveness were positively related to student concreteness, and negatively classrooms contained less pupil-initiated talk. The authors described the teacher control in terms precisely congruent with the concept of control over boundaries used in this review. However, the actual measures of control do not seem to have reflected the authors' conceptualization.

### *Studies not Distinguishing between Control and Warmth*

Flanders' System of Interaction Analysis (Flanders, 1960, 1965, 1970) has probably been the most widely used category system of classroom observation in recent years. The system requires the observer to code the predominant classroom activity during consecutive three-second intervals into one of the seven categories of teacher talk, two categories of student talk or a miscellaneous category of silence or confusion.

Flanders and his colleagues have been interested in the concept of teacher influence in the classroom. Their use of this concept has represented an explicit attempt to continue and expand the earlier work of Lewin and Anderson cited above (Flanders, 1967). From the numerous possible ways of summarizing the data collected in the interaction matrix, Flanders has chosen to emphasize the ratio of indirect teacher influence to direct teacher influence (the I/D ratio). Using this measure, it has been found in experimental studies that students learn material more effectively as measured by standardized tests (Amidon & Flanders, 1961; Flanders, 1964) and exhibit less dependent behaviour (Filson, 1957) in the classrooms with more indirect teacher influence.

Compared to the definition of teacher control as used in this review, the concept of influence does not distinguish between the concepts of teacher control and teacher responsiveness. The measure of indirect influence is the sum of teacher-behaviour categories one through four, which are: (1) accepts feelings, (2) praises or encourages, (3) accepts or uses student ideas, and (4) asks questions. The first three of these appear to reflect teacher-warmth or emotional responsiveness. The measure of direct influence combines the remaining teacher-behaviour categories: (5) lecturing, (6) giving directions, and (7) criticizing or justifying authority. Category 6, and perhaps 5, seem to contain elements of the concept of

control. Category 7 again seems to reflect the nature of the teacher's emotional relationship to the class. It appears, then, that some categories in the interaction analysis matrix reflect components of the dimensions of control and emotional responsiveness as outlined in this paper. However, the indirect-direct ratio, which is the summary measure used in most studies of the effects of teacher influence, combines elements of both dimensions, so that the results of such studies cannot be precisely integrated into findings concerning teacher control. In one study, however, Zimmerman (1970) selected out the categories most relevant to teacher-warmth and formed indices indicating amount of praise *vs.* criticism and amount of reward *vs.* punishment. He found that amount of teacher reward or praise was inversely related to the amount of anxiety in the classroom.

Another set of studies, heavily influenced by the work of both Anderson and Lewin, were those by Cogan (1956, 1957a, 1958b, 1963). This research was based entirely on pupils' questionnaire responses. The criterion measures were self-reports of the amount of required and self-initiated work done by the pupils. The questionnaire about teacher-behaviour was scored on three dimensions called Preclusiveness (authoritarian, rejecting, dominative behaviour), Inclusiveness (warm, nurturant, integrative behaviour), and Conjunctiveness (ability to communicate, classroom management, command of subject matter, and level of demands). It was expected that dominative behaviour would lead to increased student anxiety and thus to less work; and that integrative behaviour would lead to increased liking for the teacher and thus to more work. These expectations were confirmed only for inclusive teacher-behaviour. From the point of view of this review on teacher control, the variables used in these studies suffered from precisely the same difficulties as Anderson's measures.

### *Kounin's Research*

The work of Kounin and his colleagues (summarized in Kounin, 1967, 1970a, 1970b) has been the most extensive recent research on the classroom management. In this research, effective classroom management was defined as the maintenance of a high degree of work-involvement and a low amount of deviant behaviour in the classroom. To date, the authors have studied videotapes of 30 elementary classrooms taped for a half day (Kounin, Freisen, & Norton, 1966) and another 49 classrooms taped for a full day (Kounin & Obradovic, 1968). Only the behaviour in academic activities has been studied.

Using videotapes, the researchers were able to develop reliable scoring systems for a variety of teacher behaviours, some of which were found to be related to the child behaviour criteria "With-it-ness," the communication by the teacher that she could pick out significant from insignificant child misbehaviour, and "overlapping," the extent to which the teacher could keep a learning activity going while dealing with an incident of misbehaviour, both helped to increase work-involvement and decrease deviancy, as did the "smoothness" with which the teachers handled transitions between activities. The use of techniques to maintain "group-alertness" during activities (e.g. calling on children randomly to respond to questions) also decreased misbehaviour. Finally, in seatwork settings, where pupils worked individually on assignments, the most important influence on work-involvement was the extent to which the teacher provided for variety in the subject-matter and type of intellectual skills required.

This research forces another distinction to be made: one between effective classroom management and teacher control. The strategy in this research was to begin with the criterion—high work involvement and low deviancy—and to develop teacher-behaviour variables related to those criteria. The variables actually explored by Kounin seem more related to concepts of teacher enthusiasm or activity than to the concept of boundary control as presented in this paper.

### *Studies Distinguishing between Control and Warmth*

It has frequently been noted in this review that most research on teacher leadership has not contained a distinction between the degree to which a teacher restricts child freedom of choice (teacher control) and the degree to which the teacher exhibits punitive or rejecting behaviour (teacher's emotional responsiveness). Rather, both the dimensions have been encompassed under a single measure. However, a few studies have explicitly made this distinction.

Smith and Hudgins (1966) asked the fourth and fifth grade pupils to complete a revised version of the Leader Behaviour Description Questionnaire (LBDQ), which yields scores on (1) the leader's initiation of structure, and (2) the leader's consideration. However, as the authors comment, they limited the usefulness of their study by using criterion variables that were too global: each teacher made a 5-point rating of the "effectiveness" and "efficiency" of their classroom. There was between-teacher variation on LBDQ score, but the dependent measures were not sensitive enough to permit the discovery of interesting relationships.

Soar (1967, 1968, 1970) also included in his research the distinction between the degree of restriction of child behaviour and the degree of teacher-warmth. He hypothesized that a high degree of control and low teacher-warmth would both produce increased stress in the classroom, and further, that higher stress would lead to a decrement in performance on complex learning tasks. To test this hypothesis, 54 third through sixth grade classrooms were observed using Flanders' Interaction Analysis and Medley and Mitzel's OScAR; and the teachers were administered a hostility-affection scale. Then, using teachers at the extreme of the scales, one classroom from each grade level was assigned to each cell of a Control (Direct *vs.* Indirect) by Hostility (High *vs.* Low) analysis of variance table (Soar, 1967)

Criterion variables were gain scores for the school year on achievement tests of vocabulary and reading comprehension. Results were as predicted for vocabulary: there were main effects for hostility and control, and the interaction showed that students gained most in the indirect-low hostility classrooms. Though there was still a main effect for control in reading growth, other predictions did not hold. In this case the hostility by control interaction showed most growth in indirect classrooms with *high* teacher hostility. To explain this anomaly, Soar was forced to hypothesize that either: (1) the vocabulary task was more abstract than reading and was thus hampered more by anxiety, or (2) the teachers provided more specific instruction in reading than in vocabulary so that reading scores were less responsive to general classroom climate. Cogan's (1958) data tend to support the notion that the classroom climate affects a student's willingness to learn on his own more than it affects a student's willingness to abide by the minimal classroom requirements.

The level of teacher control in Soar's study was defined primarily by the indirect/direct ratio from Flanders' Interaction Analysis. This review has suggested that the I/D ratio is a questionable measure of control since it is heavily influenced by behaviour categories that reflect the teacher's emotional relationship to the class.

Christensen (1960) devised his own pupil-response questionnaires to measure teacher-warmth and teacher permissiveness. The questions on the permissiveness scale closely reflect the concept of boundary control as presented in this paper. Unlike Soar (1967) and Flanders (1965), Christensen hypothesized that permissiveness would be negatively related to achievement, and he expected the most achievement gain in warm, controlled classrooms. Dividing the eight fourth-grade teachers into the four cells of warmth by permissiveness analysis of variance and using scores on five of the Iowa tests of basic skills as criteria, Christensen found no effect

for permissiveness, and a main effect for warmth on the arithmetic and vocabulary tests only.

In some ways the studies by Soar and Christensen are directly comparable. Both used the same kind of analysis and the same criterion variables. The results were contradictory: Soar found a main effect for indirectness on both vocabulary and reading tests, whereas Christensen found no such effect for permissiveness. In fact, there are distinct differences between the two studies. Christensen's measure of warmth was a pupil questionnaire; Soar's was a teacher questionnaire, Christensen's measure of permissiveness was a pupil questionnaire about the teachers' direction of activity in the classroom; Soar's was an observational measure heavily influenced by the teacher's emotional relationship with the class.

Morrison (in press) has made explicit use of the concept of control over group boundaries that has been presented in this review. His Classroom Boundary Questionnaire is a questionnaire for teachers that measures teacher preference for degree of specific control over child activities in the classroom. The questionnaire measure has been validated against observational measures of teacher-behaviour. Both the questionnaire and the observational measures were designed to assess teacher control independently of any assessment of teacher-warmth or emotional responsiveness. In an observational study of 32 fourth through sixth grade classrooms (Morrison, 1972) a multiple regression analysis revealed that higher teacher boundary control was associated with more work-involvement and less active deviancy on the part of children. The measures of work-involvement and deviancy, similar to Kounin's (1970a) criterion variables, can be regarded as process variables relevant to classroom effectiveness.

In connection with the Classroom Boundary Questionnaire another questionnaire by Wolfson and Nash (1968) should be mentioned. This is a brief child questionnaire designed to measure pupil perceptions of how much freedom the teacher gives them to make decisions about classroom events. This seems to be a potentially useful measure of teacher boundary control. However, the questionnaire to date has been used in only a limited manner to identify within classroom differences in such perceptions.

### *Research on Specific Responses to Deviancy*

Early in this review three aspects of teacher-behaviour were delineated that might be encompassed in the concept of control: control of the classroom boundaries, the teacher's emotional relationship to the class, and specific teacher responses to undesirable behaviour. Research on attempts to stop deviant behaviour will be reviewed briefly.

Numerous studies have summarized the most troublesome problems



created for teachers by children in the classroom (Phillips, 1968; Werry & Quay, 1969) and have listed and analyzed the kinds of responses teachers make to such problems (Barnes, 1963; Herman, Duffey, Schumacher, Williams, & Zachary, 1969; Stendler, 1949). Kounin's work (1970a), however, suggests that the response made by the teachers to the deviant child behaviour might not make any difference. The aspects of teacher "desist techniques", i.e. attempts to stop deviant behaviour, once it had begun, were found to be completely uncorrelated with Kounin's criteria of work-involvement and deviancy. The aspects of desist techniques that were studied included degree of clarity, firmness, and intensity, focus (whether attention is directed to the misbehaviour or to the desired behaviour); and emotional tone (positive, negative, neutral). Morrison (1972) also found that specific teacher attempts to stop deviant behaviour after it had begun appeared to have no effect on the amount of deviant or productive behaviour in the classroom.

These findings are congruent with the research work on operant behaviour modification in the classroom. The principles of operant behaviour modification suggest that any attention to undesirable behaviour, including attempts to stop it, might in fact reinforce such behaviour. It is more useful to ignore deviant behaviour and reinforce desired behaviour. Recent studies have demonstrated that when the teachers employ techniques of operant conditioning in the classroom, either in the form of a specific token economy system or in the form of the contingent use of praise and attention, the classroom work-involvement increases and deviancy decreases (Altman & Linton, 1971; Hanley, 1970; O'Leary & Drabman, 1971; Whitman & Whitman, 1971). Despite these findings it appears that many teachers continue to take what might be called a "survival orientation" in the classroom (Dreikurs, 1968; Gray, 1967). That is, they remain concerned with techniques for punishing or confronting deviant behaviour on a moment-to-moment basis; and they ignore the question of how to help their students live within a set of expectations.

### *Relationship among Criterion Variables*

The distinction between measures of classroom effectiveness that reflect classroom processes and those that reflect the ultimate criterion of achievement has been mentioned. Increasingly common process variables, used especially in operant studies but also in other work on teacher leadership (Kounin, 1970a; Morrison, 1972) have been observational measures of pupil work-involvement and deviancy. Evidence on the relationship of these measures to the ultimate criterion of achievement in learning is as

yet conflicting. Hudgins (1967) compared behavioural ratings of attention with students' self-reports of their thoughts at specified times during class sessions. Using procedures similar to those developed by Bloom and others (Bloom, 1953; Siegel, Siegel, Capretta, Jones, & Berkowitz, 1963), these reports were scored as reflecting either subject-matter relevance or social involvements unrelated to classwork. In only two of nine junior high school classrooms was there a relationship between attention and task relevance of thoughts. In five of the nine classes, attention scores were negatively related to thoughts about social events outside the classroom. A study of the sixth-grade classrooms by Lahaderne (1968) was more encouraging. Attention was positively related to achievement in reading, arithmetic, and language, but not to attitudes about school. These results held (though at a lower level) even when IQ, which was also related to attention, was partialled out. Of course, we do not know whether these results mean that the children who are accustomed to success attend more in class or that attention in class can influence achievement level. Cobb (1972) used observational ratings of child behaviour that were more differentiated than the work-involvement and deviancy. He divided the work-involvement into attending to task, talking to another pupil about work, talking to the teacher, etc. and he divided deviancy into self-stimulation, out of chair, inappropriate talk, etc. When entered into a multiple regression equation, these variables contributed to the prediction of the scores of the fourth-grade pupils on reading, spelling, and arithmetic subtests of the Stanford Achievement Test. Similar results were found by Attwell, Orpet, and Meyers (1967), who showed that a behavioural rating for attention made in kindergarten was an important predictor of the same children's reading ability in the fifth grade.

#### SUMMARY

This review has differentiated among several aspects of teacher behaviour that might be included in the concept of teacher control. Further, an attempt has been made to offer a precise conceptualization of teacher control based on the concept of boundary control from social systems theory. Research studies on teacher leadership in the classroom have been examined to determine the extent to which they presented findings relevant to the concept of teacher control as precisely defined here.

Though several commentators on the classroom research have urged making the distinction between teacher control and the teacher's emotional relationship with the class, and though research from other areas relevant to the exercise of authority has supported the validity of such a

distinction, studies on teacher leadership for the most part have continued to use measures that do not allow for separate assessments of these two dimensions. In the studies reviewed here, only two, those by Christensen (1960) and Morrison (1972, *in press*) used measures of teacher-behaviour that appear to be consistent with the concept of boundary control.

Some necessary conditions for accumulating precise knowledge about the effects of teacher control in the classrooms are easy to outline but difficult to implement. Researchers should use measures of teacher control that are based on a theory of group leadership and that allow for separating the effects of control from the effects of other aspects of teacher-behaviour or personality. Further, research should be designed so as to allow for investigating empirically the interrelationships among measures. In this review several categories of criterion measures and independent variables have been outlined. Most studies have tended to use only one sort of predictor or criterion variable. Consequently, we do not know much at present about the relationships among process measures of classroom effectiveness and measures of academic achievement. Also, we can only compare the various measures of teacher leadership on a logical basis since we do not have empirical information about the extent of the correlations among the numerous measures that have been used.

The difficulties inherent in conducting research along the lines suggested here should not be underestimated. What has been suggested is that research on teacher leadership should involve multivariate studies—studies using multiple measures of both predictor and criterion variables. One difficulty with this approach is that the data gathered must be subjected to sophisticated data analysis techniques. Another difficulty is that multivariate studies require the number of subjects to be relatively large compared to the number of variables used. This means that observations must be done in many classrooms, and classroom observations tend to be time-consuming and expensive. These are serious pragmatic problems over and above the epistemological problem of the impact of the observer on the behaviour in the classroom being observed, a difficult enough problem in its own right (Masling & Stern, 1969).

This review has examined teacher control of classroom boundaries as an aspect of teacher leadership behaviour in the classroom. It has also attended to the dimension of teacher warmth or emotional responsiveness, which is the dimension that has most usually been confounded with teacher control. The factor analytic studies cited above are not definitive, but they suggest a way to fit the dimension of teacher control into the larger framework of teacher leadership in the classroom. Taken as a whole, those studies suggest that control may be one of the three important dimensions of teacher leadership behaviour, the others of which are: teacher-warmth or respon-

siveness and teacher-enthusiasm or activity level. Further investigation of all the three of these dimensions, clearly delineated from each other, and of their interrelationships, seems warranted at this time.

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# Logical Thought Development in Children : A Study

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*The investigation was designed to study the transfer-effect, if any, of conservation training of length, mass, weight and number on conservation of area and volume. The investigation has a two-fold aim. The first was to study the effect of conservation training in certain quantities on conservation of other quantities for which no training was given. The second was to examine the relative efficacy of verbal and non-verbal training techniques in conservation training.*

*The experimental design was a 2 (sex) X 2 (techniques of training) 5 (age levels) X 4 (order of training/testing) design. There were two replications in each cell. The total number of subjects was 324 in the age-group 4-7 years.*

*A five-stage sampling procedure was employed to select the subjects for the study. The subjects were assigned to the experimental and control groups at random. At the commencement of the study all the subjects in the control and experimental groups were tested for conservation of area and volume. Only non-conservers of area and volume were studied in this investigation. The experimental group of subjects was divided into two training groups at random. The two training procedures employed were (a) verbal training technique and (b) non-verbal training technique.*

*The subjects in the control and the experimental groups were all tested prior to training on conservation of length (L), Mass (M), weight (W) and number (N). All the subjects were trained and tested individually. The subjects in the control group were tested along with those in the experimental group at the conclusion of the investigation for conservation of area (A) and volume (V) as well as on L, M, W, and N.*

*The obtained data were first tested for homogeneity and ANOVA was employed to analyse the data. The hypotheses were examined.*

*The results obtained in this investigation point to the following conclusions:*

- 1. The age of the subjects is significantly related to conservation performance. Older children are able to perform better than younger children.*
- 2. There are no significant differences with regard to sex in conservation performance.*

3. Conservation training was found to significantly influence the conservation performance of younger children (4-6 years age-group).

4. There is no transfer effect of conservation training from one type of quantity to another. That is, the subjects who were trained in the conservation of mass, for example, did not show improvement in their performance in the conservation of area or volume for which no training was given. Training in conservation of  $L$ ,  $M$ ,  $W$ , and  $N$  does not ipso facto lead to improvement in conservation of area, volume etc.

The conservation training techniques employed (verbal training technique and non-verbal training technique) resulted in different results. The verbal training technique was found to be more effective than the non-verbal technique. The results showed that the order of presentation of quantities did not significantly affect the conservation performance of subjects.

Our results largely corroborate Piaget's findings. However, there are significant deviations. The results demonstrate that the verbal training technique is superior to the non-verbal training technique.

The important educational implications of the findings of this study are .

1. As no 'transfer' of conservation training from one type of quantity to another was found, it is suggested that if young children are given conservation training, it should be in all the quantities.

2. The finding that children acquire conservation of different quantities fully at different age levels suggests that we must adapt our teaching methods to suit the intelligence level of our students.

3. Our results suggest that didactic methods would be fruitful if they are properly designed to suit the cognitive levels attained by the children.

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WHAT is the effect of experience (through training) on logical thought development? The role of such experience is not clear, although the Geneva group considers experience to have a significant place in cognitive development. Piaget seems lukewarm to the idea that experience alone may significantly alter developmental patterns.

What is the differential efficacy of verbal and non-verbal training procedures? The Geneva group is committed to the view that verbal

\*This paper is based on a research project, 'Logical Thought Development in Children', founded by the NCERT. The author is grateful to the NCERT, New Delhi, for the assistance.

processes become articulated with logical thought only after the development of a non-verbal infra-logical and logical schema.

Wohlwill (1962) and Ervin (1960) demonstrated the limitations of verbal training and their discussions reflect some skepticism regarding the role of verbal mediation in logical thought, although the opposite view is given credence (Braine and Shanks, 1965)

Studies converging on the problem of the nature of cognitive growth do not present strong support for Piagetian theory. The investigations of Beilin, Braine, Dodwell and Shantz, exemplify this effort. The results are equivocal. Definite statements concerning the hierarchical and integrative nature of Piagetian theory cannot be made

The present investigation was designed to study children's conservation of different quantities. It was aimed to study the effect of training on the one hand, and on the other, the differential effect of different types of training on conservation performance.

The study was planned to test Piaget's views concerning experience and learning. Further, the study attempted to investigate the differential efficacy of verbal and non-verbal training procedures. This is of importance since the Geneva group holds that verbal processes become articulated with logical thought only after the development of a non-verbal, infra-logical and logical schema. A few studies have demonstrated the limitations of verbal training procedures. The usefulness of verbal training was also sought to be examined in this study.

The following hypotheses were formulated for testing.

1. Training would have significant influence on conservation performance
2. The type of training given would have significant influence on conservation performance.
3. The order of presentation of different quantities in the training procedure would not yield significant differences in conservation performance.
4. There would be no transfer of training from one type of quantity to another, e.g. from mass to area.

The total number of subjects in the study was 320, comprising boys and girls divided into five age-groups commencing from 4 years through 6 years with half-year intervals. All the subjects were selected by a five stage sampling procedure.

The experimental design employed in this investigation was a  $2 \times 2 \times 5 \times 4$

design with sexes (2), conditions of training (2), age levels (5) and order of training (4). There were two replications

Although the experimental design of the study necessitated the employment of 320 subjects, 480 subjects (i.e., 50% more than the actual number of subjects required) were randomly selected for participation in the laboratory investigation. This was a precautionary measure, adopted to make up for the loss of subjects at any stage of the investigation

The control and the experimental groups were pre-tested. A common procedure was followed for all the subjects. The experimental subjects were individually trained in accordance with the experimental design and at the end of the training period the subjects were post-tested. The subjects of the control group were post-tested with the same procedure as was followed for the subject of the experimental group. There was no training period intervening between the pre-testing and post-testing sessions for the subjects of the control group.

### *Materials*

The materials employed in the investigation were as follows:

For conservation of Mass:	Plasticine in six different colours.
For conservation of Weight:	Plasticine in six different colours.
For conservation of Length.	1" long cylindrical wooden pieces of $\frac{1}{2}$ " diameter
For conservation of Number.	Coloured plastic chips in six different colours.
For conservation of Area:	Flannel board and 12 pairs of geometrical figures drawn on white board with sandpaper backs.
For conservation of Volume:	External—three pairs of plastic tumblers of three different sizes and a bucket. Internal—two round-bottomed glass flasks of 500 ml. and two coloured liquids and a basin.

Materials used for pre-testing, training and post-testing were similar except for differences in colour.

### *Procedure*

1. All the subjects were pre-tested for conservation of area and volume.

2. After the pre-test the experimental groups of subjects were individually trained on four conservation tasks: length (L), mass (M), weight (W) and number (N). The order of training was pre-determined for each subject. There were four orders of training, viz. L, M, W, N; M, W, N, L; W, N, L, M; N, L, M, W. Subjects were randomly assigned to the four orders of training. There was an equal number of subjects for the four training orders in the experimental group.
3. Next, the experimental subjects were randomly exposed to the two methods of training—verbal and non-verbal. The two methods were employed on an equal number of subjects.

Each subject was trained on one quantity only in a single session (one day). The conservation training for each quantity was given on alternative days. At the end of the training sessions, the subjects were post-tested with an interval of one day after the last training session (i.e., the post-training testing was done on the ninth day after the first training session). Both the experimental and the control groups were subjected to the procedure and order followed during training—the subjects of the experimental group, trained in a particular order (e.g. LMNW), were post-tested in the same order (LMNW).

The pre-tests and post-tests for area and volume conservation were common for both the control and experimental groups. In addition, the groups were tested for conservation of L, M, W and N, in order to find out improvement owing to training, if any.

The experimental group of subjects was trained under two conditions—verbal and non-verbal. The subjects were pre-tested on the first day of their laboratory session on area and volume conservation. All the subjects from the two groups took these pre-tests. After an interval of one week, the subjects were assigned at random to one of the two groups, to be given verbal or non-verbal training. The subjects who were tested on the first day of the week were brought to the laboratory on the first day of the following week, thus giving an interval of one week between the first and second visit of the subjects to the laboratory.

### *Verbal Training Procedure*

Two rows of blocks were placed in front of the subject and he/she was asked to count the number of blocks in each row aloud. The examiner made one row longer and asked the subject to judge which row had more blocks. The subject was asked to count aloud. The examiner said, 'The

number of blocks is the same. The blocks are only placed apart, so that the row is lengthened. No blocks are added or removed. Therefore there is no change in the number. When no blocks are added or removed the number remains the same'. The subject was asked to repeat this rule aloud.

The examiner now tested the subject with a different number of blocks. The same procedure was followed. The examiner made a row shorter. The subject was asked to count aloud and to repeat the conservation principle. Next he/she was asked to explain whether the number of blocks was the same. The examiner explained if the subject could not explain. Ten trials were given with each quantity (L, M, W and N).

#### *Non-verbal Training Procedure*

The subject was presented with two rows of blocks as above and asked to judge whether the two rows had the same number of blocks. One row was lengthened. If the subject judged correctly he/she was given a chip. If his response was wrong another trial was given. Five trials were given. The examiner presented two other rows. He shortened one row and asked the subject to judge whether the number of blocks was the same. If the subject's answer was correct, he/she was given a chip. If it was wrong, another trial was given. Five trials were given.

#### *Tests and Scoring*

Piaget type tasks were used to test for conservation of all the quantities (M, W, N, V and A). Scoring of the subjects' responses was based on two criteria.

1. *Performance Criterion* For length and number tests, the subject's response was counted correct if he chose the row or the window, as the case may be, correctly. If the response was correct, the subject was awarded a credit of one point.

2. *Qualitative Verbal Criterion*. This was based on the rationale of the subject response. The common procedure employed throughout the investigation was to give the subjects two practice trials to familiarize them with the test situation and the apparatus. After the two practice trials, the training or testing trials were given.

The data were analysed mainly to examine the following:

1. The effect of training and the possibility of transfer of conservation from one quantity to another;
2. The relative efficacy of verbal and non-verbal training techniques in bringing about the above;
- 3 Whether improvement in conservation performance could be effected at all by imparting training.

The obtained data were first tested for homogeneity. As the obtained  $X^2$  values were not equally significant, the data were taken as homogeneous. The hypotheses formulated for investigation were examined in the light of the results obtained as follows:

*Hypothesis 1* : Training would significantly influence the conservation performance of the subjects. Training was imparted to the experimental subjects by two methods—the verbal method and the non-verbal method.

All the subjects, both in the control and the experimental groups, were pre-tested on conservation of area and volume and at the end of the training period the subjects in the experimental group were post-tested. This was done with a view to examine the effects of training, if any

TABLE 1  
ANOVA OF LENGTH, MASS, WEIGHT AND NUMBER SCORES ON  
PRE-TEST-CONTROL GROUP

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MSS</i>	<i>F</i>	<i>Significance</i>
A (Sex)	14.40	1	14.40	0.8396	
B (Conditions)	2.75	1	2.75	0.1803	
C (Quantities)	50786.66	3	16928.89	987.1100*	**
D (Age Levels)	16408.38	4	4102.09	239.1900	**
A × B	0.056	1	0.056	—	
A × C	39.69	3	13.23	0.7714	
A × D	272.31	4	68.08	3.9700	**
B × C	35.34	3	1.78	0.6800	
B × D	3.80	4	0.95	—	
C × D	3555.04	12	296.25	17.2700	**
A × B × C	2.56	3	0.85	—	
A × B × D	1.83	4	0.46	—	
A × C × D	161.06	12	13.42	0.7800	
B × C × D	14.04	12	1.17	0.0700	
A × B × C × D	8.73	12	0.73	—	
Within	9605.25	560	17.15		
TSS	80911.90	639			

\*\*Significant at both levels



TABLE 2  
ANOVA OF LENGTH, MASS, WEIGHT AND NUMBER SCORES ON  
PRE-TEST EXPERIMENTAL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	14.40	1	14.40	0.61
B (Conditions)	0.06	1	0.06	—
C (Quantities)	50684.59	3	16894.86	724.16 **
D (Age Levels)	16749.60	4	4187.40	179.48 *
A × B	0.006	1	0.006	—
A × C	81.11	3	27.03	1.15
A × D	251.54	4	62.88	2.69 *
B × C	0.45	3	0.15	—
B × D	1.44	4	0.36	—
C × D	2566.54	12	213.87	9.16 **
A × B × C	17.57	3	5.85	0.25
A × B × D	3.00	4	0.75	—
A × C × D	372.46	12	31.04	1.33
B × C × D	17.79	12	1.48	—
A × B × C × D	11.18	12	0.93	—
Within	13063.25	560	23.33	
TSS	83834.98	639		

\*\*Significant at both levels

\*Significant at .05 level

TABLE 3  
ANOVA OF AREA AND VOLUME SCORES ON PRE-TEST-CONTROL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	12.41	1	12.41	0.78
B (Conditions)	31.88	1	31.88	2.00
C (Quantities)	1121.26	1	1121.26	70.43 **
D (Age Levels)	8435.11	4	2108.78	132.46 **
A × B	2.27	1	2.27	0.14
A × C	2.27	1	2.27	0.14
A × D	86.95	4	21.49	1.34
B × C	0.70	1	0.70	—
B × D	33.48	4	8.37	0.52
C × D	92.97	4	23.24	1.45
A × B × C	0.15	1	0.15	—
A × C × D	52.72	4	13.18	0.82
A × B × D	7.71	4	1.93	0.12
B × C × D	8.78	4	2.19	0.13
A × B × C × D	12.84	3	3.21	0.20
Within	4458.13	280	15.92	
TSS	14358.63	319		

\*\*Significant at both levels

TABLE 4  
ANOVA OF AREA AND VOLUME SCORES ON POST-TEST-CONTROL GROUP

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MSS</i>	<i>F</i>
A (Sex)	24.75	1	24.75	1.43
B (Conditions)	294.53	1	294.53	17.13 **
C (Quantities)	1642.58	1	1642.58	95.55 **
D (Age Levels)	10019.39	4	2504.84	145.71 **
A × B	3.40	1	3.40	9.19
A × C	0.90	1	5.90	—
A × D	123.20	4	30.80	1.79
B × C	5.77	1	5.77	0.33
B × D	102.36	4	25.59	1.48
C × D	164.18	4	41.04	2.38 *
A × B × C	0.08	1	0.08	—
A × B × D	2.80	4	0.70	—
A × C × D	55.81	4	14.70	0.85
B × C × D	7.37	4	1.84	0.10
A × B × C × D	4.75	4	1.14	0.06
Within	4813.88	280	17.19	
TSS	17268.75	319		

\*\*Significant at both levels

\*Significant at .05 level

TABLE 5  
t - TEST OF DIFFERENCES OF MEANS OF CONTROL AND  
EXPERIMENTAL GROUPS

<i>Age</i>	<i>Verbal Boys</i>	<i>Verbal Girls</i>	<i>Non-Verbal Boys</i>	<i>Non-Verbal Girls</i>
LENGTH				
4	0.020	0.669	0.253	0.836
4½	0.184	0.857	0.249	0.802
5	—	—	—	—
5½	—	—	—	—
6	—	—	—	—
MASS				
4	—	0.996	0.102	0.234
4½	—	0.173	0.258	0.438
5	0.049	0.376	0.072	0.608
5½	0.211	0.367	0.198	0.154
6	0.136	—	0.598	0.957

# THOUGHT DEVELOPMENT IN CHILDREN

## WEIGHT

4	0 010	0 746	0 205	0 421
4½	0 097	0 464	0 387	0 320
5	0 011	0 651	0 306	0 251
5½	0 231	0 190	0 488	0 252
6	0 163	0 474	0 784	1 307

## NUMBER

4	0 322	0 625	0 451	1 128
4½	0 401	0 789	0 928	0 653
5	0 032	0 406	0 028	0 178
5½	0 080	0 375	0 047	0 410
6	0 324	0 287	1 422	1 196

(All t's not significant)

The analyses of variance of the pre-training test scores of the experimental group (Tables 1 & 2) show that the F ratios for quantities and age levels alone are significant. In addition, the interaction between quantities and age levels and conditions and quantities are also significant. Other F ratios are not significant. The analysis of variance of the pre-test training scores for the control group (Table 3) also show the same kind of results. The results obtained suggest that no sex differences are significant in both the control and experimental groups. The only significant differences are found to exist between subjects of different age levels and differences in the conservation of different quantities. Thus the two groups were comparable.

The t-tests (Table 5), formulated to examine the differences between the means of the two groups, show that the t-values are not significant at .05 level. In the post-training test the differences between the control and experimental groups are significant on all the quantities for which training was given, viz. Length, Mass, Weight and Number.

The results thus show that training does positively influence conservation performance. Since the experimental groups received training, their conservation performance significantly improved. The control group (Table 4) did not show any improvement in their conservation performance as they did not receive any training. The hypothesis that training significantly improves conservation performance is retained on the basis of the results obtained.

Since two types of training procedures were employed, the next hypothesis was concerned with the efficacy of the training procedures.

*Hypothesis 2* : There would be no significant differences in the conservation performance of the subjects assigned to verbal and non-verbal training procedures, i.e. the type of training procedure employed would not yield significant differences.

The analysis of variance of the conservation scores of the quantities of Length, Mass, Weight and Number on the post-test of the experimental group of subjects (Table 6) show that the F-ratios for sex, conditions (training procedures), quantities, age and interactions between sex and age conditions and quantities, conditions and age, quantities and age are all significant at 01 level.

TABLE 6  
ANOVA OF LENGTH, MASS, WEIGHT AND NUMBER SCORES ON  
POST-TEST-EXPERIMENTAL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	203.62	1	203.62	7.86 **
B (Conditions)	1991.62	1	1991.62	76.89 **
C (Quantities)	40916.07	3	13638.69	526.54 **
D (Age Levels)	21652.38	4	5413.09	208.98 **
A × B	0.12	1	0.12	—
A × C	161.33	3	53.79	2.07
A × D	571.57	4	142.89	5.51 **
B × C	656.50	3	218.83	8.44 **
B × D	338.04	4	84.51	3.26 **
C × D	6667.64	12	555.63	21.45 **
A × B × C	12.01	3	4.00	0.015
A × B × D	40.04	4	10.01	0.030
A × C × D	283.08	12	23.59	0.910
B × C × D	182.99	12	15.25	0.588
A × B × C × D	173.62	12	14.47	0.550
Within	14505.38	560	25.902	
TSS	88356.06	639		

\*\*Significant at both levels

The t-test (Table 7) shows that at all age levels the t-values were significant both for boys and girls. The t-values for Mass, Weight and Number are significant at .05 level. A few of them are significant at .01 level also. The verbal method of training was decidedly more effective than the non-verbal method.

TABLE 7

t-TEST VALUES OF SIGNIFICANCE OF MEAN DIFFERENCES  
BETWEEN PRE-TRAINING AND POST-TRAINING CONSERVATION TASK  
SCORES (BOYS-GIRLS)

Age	Mass		Weight		Number		Area		Volume	
	Verbal	Non-Verbal	Verbal	Non-Verbal	Verbal	Non-Verbal	Verbal	Non-Verbal	Verbal	Non-Verbal
BOYS										
4	4.47	1.84	3.93	1.07	3.24	—	1.85	1.36	1.76	1.03
4½	4.16	—	2.45	2.04	3.36	2.08	1.07	1.15	2.03	1.65
5	3.03	—	3.62	—	3.41	—	1.24	1.05	1.71	1.71
5½	3.16	1.34	3.92	—	4.33	2.07	1.88	1.28	1.43	1.54
6	3.95	1.65	5.93	1.77	4.17	0.78	1.96	1.91	2.10	2.01
GIRLS										
4	2.52	—	3.10	1.11	3.30	1.42	2.02	1.79	1.37	—
4½	5.66	1.07	4.51	1.22	3.45	—	—	1.82	1.97	—
5	3.24	1.04	4.28	1.81	3.00	1.02	2.07	—	1.42	1.30
5½	3.44	1.81	3.12	—	4.43	—	2.07	1.95	1.42	1.43
6	3.09	—	3.05	—	3.13	—	1.96	1.50	2.03	—

The hypothesis that no significant differences in conservation scores would result from the use of the two training procedures is rejected as unwarranted on the basis of the above results.

As the major concern of this investigation was to discover the transfer effects, if any, in conservation performance, the design of the study involved training of the experimental group of subjects on four conservation tasks. The control group did not receive any such training. At the end of the training period, both the groups—experimental and control, were tested for conservation of Area and Volume.

Any improvement in the post-test performance of conservation of Area and Volume in the experimental group could be construed as a result of transfer of training received in conservation of Length, Mass, Weight and Number. Since the subjects were pre-tested prior to training, any improvement could be owing to familiarity with the task. In order to obviate this, a control group of subjects was also pre-tested and post-tested with regard to conservation performance of Area and Volume.

The analysis of variance of the control group pre-test conservation performance with regard to Area and Volume yielded significant F-ratios for age levels and quantities. The analysis of the results of the experimental group yielded similar results. The post-test results of the two groups—

TABLE 8  
ANOVA OF AREA AND VOLUME SCORES ON PRE-TEST-  
EXPERIMENTAL GROUP

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MSS</i>	<i>F</i>
A (Sex)	20.00	1	20.00	1.278
B (Conditions)	3.20	1	3.20	0.200
C (Quantities)	987.01	1	987.01	63.140 **
D (Age Levels)	8573.70	4	2143.42	137.130 **
A × B	—	1	—	—
A × C	1.51	1	1.51	0.09
A × D	122.91	4	30.73	1.96
B × C	2.81	1	2.81	0.17
B × D	5.02	4	1.25	0.07
C × D	14.71	4	3.67	0.23
A × B × C	12.01	1	12.01	0.76
A × B × D	4.72	4	1.18	—
A × C × D	18.59	4	4.65	—
B × C × D	9.23	4	2.31	—
A × B × C × D	9.88	4	2.47	—
Within	4377.50	280	15.63	
TSS	14162.80	319		

\*\*Significant at both levels

experimental and control — are similar. The only difference was that for the experimental group the F-ratio for the conditions (training procedures) was also significant.

The t-tests (Tables 9, 10, 11, & 12) for Area for both the experimental and control groups in the pre-test were not significant. In the post-test (Tables 13, 14, 15, 16 & 17), the t-values were also quite insignificant at .05 level. For both boys and girls the results obtained are comparable. This suggests that the training given to experimental subjects did not yield significant differences, showing that conservation performance is not transferable from one quantity to another. The table of means presented adumbrate the above findings. The hypothesis that conservation performance is not transferable is retained as the obtained results fully support this conclusion (Tables 14 to 19).

The hypothesis that there would be no significant difference in conservation performance as a result of a specific kind of training procedure employed was examined next.

After the pre-training test the experimental group was divided into two sub-groups by random assignment of subjects. One group was trained by

TABLE 9

SIGNIFICANCE OF DIFFERENCE BETWEEN MASS (t-TEST) OF PRE AND POST-TRAINING TESTS AREA CONSERVATION SCORES OF VERBAL AND NON-VERBAL TRAINING TECHNIQUES—BOYS

<i>Age</i>	<i>Pre Test</i>		<i>Post-Test</i>	
	<i>Control</i>	<i>Experimental</i>	<i>Control</i>	<i>Experimental</i>
AREA				
4	0.024	0.354	0.056	0.490
4½	—	0.339	0.350	1.395
5	0.259	0.332	0.536	0.577
5½	0.072	0.616	1.439	1.042
6	0.934	0.543	1.363	1.442

TABLE 10

SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS (t-TEST) OF PRE AND POST-TRAINING TESTS VOLUME CONSERVATION SCORES OF VERBAL AND NON-VERBAL TRAINING TECHNIQUES—BOYS

<i>Age</i>	<i>Pre-Test</i>		<i>Post-Test</i>	
	<i>Control</i>	<i>Experimental</i>	<i>Control</i>	<i>Experimental</i>
VOLUME				
4	1.861	0.694	1.397	0.642
4½	0.809	0.253	—	0.700
5	0.514	—	0.960	0.748
5½	—	0.263	0.627	1.279
6	1.102	0.471	1.884	0.781

TABLE 11

SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS (t-TEST) OF PRE AND POST-TRAINING TESTS ON VOLUME CONSERVATION SCORES OF VERBAL AND NON-VERBAL TRAINING TECHNIQUES—GIRLS

<i>Age</i>	<i>Pre-Test</i>		<i>Post-Test</i>	
	<i>Control</i>	<i>Experimental</i>	<i>Control</i>	<i>Experimental</i>
VOLUME				
4	0.499	0.847	0.385	1.370
4½	0.639	0.161	0.685	1.060
5	0.014	0.060	0.788	1.430
5½	0.020	0.958	0.723	1.980
6	0.935	0.150	1.862	2.030

TABLE 12

SIGNIFICANCE OF DIFFERENCE BETWEEN MEANS (t-TEST) OF PRE AND POST-TRAINING TESTS ON AREA CONSERVATION SCORES OF VERBAL AND NON-VERBAL TRAINING TECHNIQUES—GIRLS

Age	Pre-Test		Post-Test	
	Control	Experimental	Control	Experimental
AREA				
4	0.742	—	1.641	0.778
4½	0.587	—	0.462	0.393
5	0.342	0.963	1.121	1.689
5½	—	0.441	0.493	0.293
6	1.829	1.068	1.750	0.359

TABLE 13

ANOVA OF AREA AND VOLUME SCORES ON POST-TEST  
EXPERIMENTAL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	15.31	1	15.31	0.86
B (Conditions)	470.45	1	470.45	26.42 **
C (Quantities)	858.05	1	858.05	48.20 **
D (Age Levels)	12007.39	4	3001.85	168.64 **
A × B	63.01	1	63.01	3.53
A × C	12.01	1	12.01	0.67
A × D	198.03	4	49.51	2.78
B × C	11.25	1	11.25	0.63
B × D	63.83	4	15.96	0.89
C × D	35.17	4	8.79	0.49
A × B × C	15.30	1	15.30	0.85
A × B × D	37.02	4	9.25	0.51
A × C × D	6.21	4	1.55	0.08
B × C × D	19.41	4	4.85	0.27
A × B × C × D	22.36	4	5.59	0.31
Within	4982.75	280	17.80	
TSS	18817.55	319		

\*\*Significant at both levels



TABLE 14

t-TEST VALUES FOR MEAN DIFFERENCES OF CONSERVATION SCORES OF POST-TRAINING TEST ON M, W AND N OF EXPERIMENTAL AND CONTROL GROUPS BETWEEN VERBAL AND NON-VERBAL TRAINING PROCEDURES (BOYS AND GIRLS)

Age	Mass	Boys		Girls		
		Weight	Number	Mass	Weight	Number
4	3.35	2.51	2.73	1.65	1.68	1.36
4½	3.26	3.04	3.09	3.47	2.32	2.68
5	2.50	2.17	3.42	2.64	3.99	3.84
5½	2.32	3.27	2.33	1.62	2.70	2.23
6	2.87	2.35	2.46	3.00	2.59	2.18

TABLE 15

t-TEST VALUES OF MEAN DIFFERENCES OF CONSERVATION SCORES OF PRE-TRAINING TEST ON M, W AND N OF EXPERIMENTAL AND CONTROL GROUPS BETWEEN VERBAL AND NON-VERBAL TRAINING PROCEDURES

Age	Mass		Weight		Number	
	Control	Experimental	Control	Experimental	Control	Experimental
4	.620	.027	.680	.015	0.019	.720
4½	.390	.260	.440	.010	.500	.007
5	.320	.304	.207	.306	.450	.252
5½	.440	.009	.330	—	.140	—
6	.430	.088	.330	.002	.250	.130

TABLE 16

t-TEST VALUES OF MEAN DIFFERENCES OF BOYS CONSERVATION OF AREA SCORES UNDER VERBAL AND NON-VERBAL TRAINING BETWEEN PRE. AND POST-TRAINING TEST SCORES

Age	Verbal		Non-Verbal	
	Control	Experimental	Control	Experimental
4	1.530	1.350	0.780	0.990
4½	0.990	1.760	0.820	1.800
5	1.810	0.910	1.760	1.220
5½	0.920	1.810	0.830	0.940
6	2.003	2.126	0.890	1.970

TABLE 17

t-TEST VALUES OF MEAN DIFFERENCES OF BOYS' CONSERVATION  
OF VOLUME SCORES UNDER VERBAL AND NON-VERBAL TRAINING  
CONDITIONS BETWEEN PRE AND POST-TRAINING TEST SCORES

Age	Verbal		Non-Verbal	
	Control	Experimental	Control	Experimental
4	0.520	1.150	1.140	0.750
4½	0.930	0.820	0.550	1.030
5	0.960	0.920	0.576	1.312
5½	0.850	1.010	0.460	1.070
6	1.480	1.440	0.920	1.120

TABLE 18

t-TEST VALUES OF MEAN DIFFERENCES OF GIRLS' CONSERVATION  
OF AREA SCORES UNDER VERBAL AND NON-VERBAL TRAINING  
CONDITIONS BETWEEN PRE AND POST-TRAINING TEST SCORES

Age	Verbal		Non-Verbal	
	Control	Experimental	Control	Experimental
4	1.570	1.660	1.320	2.120
4½	0.680	1.710	0.988	1.330
5	1.890	1.510	0.980	0.400
5½	1.470	1.870	0.330	1.430
6	1.930	1.870	0.760	0.490

TABLE 19

t-TEST VALUES OF MEAN DIFFERENCES OF GIRLS' CONSERVATION  
OF VOLUME SCORES UNDER VERBAL AND NON-VERBAL TRAINING  
CONDITIONS BETWEEN PRE AND POST TRAINING TEST SCORES

Age	Verbal		Non-Verbal	
	Control	Experimental	Control	Experimental
4	0.540	1.060	0.560	0.644
4½	0.732	0.589	0.698	0.528
5	0.689	0.948	0.484	0.934
5½	0.910	0.770	0.304	1.040
6	0.550	0.522	0.450	0.557

the Verbal Rule Instruction technique, the other by non-verbal technique, i.e. it was not trained by employing any verbal rule instruction or verbal directions. The two training groups were designated verbal training and non-verbal training groups. The Tables 14 to 17 present the means, SDs and the 't's of the difference between the means for boys and girls. The results show that there is significant difference between the performance of the subjects placed under different training conditions (treatments). The verbal training group consistently scored higher than the non-verbal training group on the conservation of Mass, Weight and Number. The t's are also significant at .05 level. A few of them are significant at .01 level also.

Conservation performance of the group in post-tests on conservation of Area and Volume did not show any significant differences. The t-values of the difference between the conservation performance of verbal and non-verbal training groups were not significant at .05 level. The analysis of variance of the conservation performance on the quantities Length, Mass, Weight and Number yielded F-ratios significant at .01 level for the training conditions. The analyses of variance of conservation performance on quantities Area and Volume (Tables 8 and 13) show F-ratios significant for conditions of training and age level. The t-test (Tables 16, 17, 18), made to examine differences between the groups, revealed no significant differences.

The subjects in the two groups were tested for conservation performance on Area and Volume. In the pre-test the differences between the control and experimental groups were not significant. The same results were obtained in the post-training test also. This suggests that conservation training with one quantity will not help improve conservation performance with another quantity.

*Hypothesis 3:* No significant differences in the performance of the subjects would be observed as a result of the order of presentation of quantities in testing and training.

In training as well as testing, the groups were tested according to a pre-determined random order. Thus one group of subjects was trained/tested in Length, while the second group was started on Mass, the third group on Weight, and so on. Analyses of variance showed that the order of training/testing did not significantly affect performance. The F-ratios for Mass, Weight, Number were insignificant at .05 level. This suggests that the order of presentation does not affect conservation performance significantly. The hypothesis that no significant differences would result on account of changes in the order of presentation of the different quantities is retained as the results obtained warrant the same (Table 20 to 23).

TABLE 20  
ANOVA OF LENGTH SCORES—CONTROL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	7.20	1	7.20	0.45
B (Conditions)	0.40	1	0.40	—
C (Quantities)	77.55	3	25.85	1.65
D (Age Levels)	1669.60	4	417.40	26.65 **
A × B	0.62	1	0.62	—
A × C	4.75	3	1.58	—
A × D	49.92	4	12.48	0.79
B × C	45.15	3	15.05	0.96
B × D	0.85	4	0.21	—
C × D	152.70	12	12.72	0.81
A × B × C	37.13	3	12.38	0.79
A × B × D	4.01	4	1.00	—
A × C × D	23.38	12	1.94	—
B × C × D	119.85	12	9.98	—
A × B × C × D	67.49	12	5.62	—
Within	1253.00	80	15.66	
TSS	3513.60	159		

\*\*Significant at both levels

TABLE 21  
ANOVA OF MASS SCORES—CONTROL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	2.76	1	2.76	—
B (Conditions)	11.56	1	11.56	0.85
C (Quantities)	10.17	3	3.39	—
D (Age Levels)	4391.06	4	1097.76	80.83 **
A × B	0.30	1	0.30	—
A × C	2.92	3	0.97	—
A × D	103.59	4	25.89	1.90
B × C	4.42	3	1.47	—
B × D	4.79	4	1.19	—
C × D	114.74	12	9.56	—
A × B × C	37.57	3	12.52	0.92
A × B × D	10.16	4	2.54	—
A × C × D	167.61	12	13.97	1.02
B × C × D	102.61	12	8.55	—
A × B × C × D	191.84	12	15.99	1.17
Within	1086.50	80	13.58	
TSS	6242.60	159		

\*\*Significant at both levels

TABLE 22  
ANOVA OF WEIGHT SCORES—CONTROL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	0.01	1	0.01	—
B (Conditions)	10.51	1	10.51	0.89
C (Quantities)	28.77	3	9.59	0.81
D (Age Levels)	3140.85	4	785.21	68.54 **
A × B	1.05	1	1.05	—
A × C	20.52	3	6.84	0.58
A × D	95.65	4	23.91	2.02
B × C	28.22	3	9.41	0.79
B × D	6.15	4	1.54	—
C × D	175.20	12	14.60	1.23
A × B × C	17.97	3	5.99	0.50
A × B × D	3.85	4	0.96	—
A × C × D	251.70	12	20.97	1.77
B × C × D	72.00	12	6.00	0.50
A × B × C × D	123.00	12	10.25	0.86
Within	944.53	80	11.80	
TSS	4919.95	159		

\*\*Significant at both levels

TABLE 23  
ANOVA OF NUMBER SCORES—CONTROL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	44.10	1	44.10	1.67
B (Conditions)	15.62	1	15.62	0.59
C (Quantities)	36.45	3	12.15	0.46
D (Age Levels)	10761.91	4	2690.47	102.10 **
A × B	0.63	1	0.63	—
A × C	122.75	3	40.92	1.55
A × D	184.21	4	46.05	1.74
B × C	115.63	3	38.54	1.46
B × D	6.07	4	1.52	—
C × D	938.74	12	78.23	2.96 **
A × B × C	15.92	3	5.31	—
A × B × D	15.06	4	3.76	—
A × C × D	600.44	12	50.04	1.89 *
B × C × D	440.68	12	36.72	1.39
A × B × C × D	110.89	12	9.24	—
Within	2108.00	80	26.35	
TSS	15517.10	159		

\*\*Significant at both levels

\*Significant at 01 level

The results of this investigation prove that children of different age levels significantly differ from one another with regard to their conservation performance. The older children perform significantly better than younger children.

Apart from the differences owing to age variations, there were no differences between boys and girls in conservation performance.

The major finding of the study is that there is no transfer effect in conservation of different quantities, i.e. children who are trained on one kind of quantity would not automatically profit from it in their performance with another type of quantity. This has very significant implications for educational practice.

Within the conditions of the present investigation, it was found that the type of training employed, i.e. the Verbal Rule Instruction method or non-verbal method, significantly affected the conservation performance of children.

There was obvious improvement in conservation performance from the pre-training test to the post-training test on all the quantities for which training was given.

TABLE 24  
ANOVA OF LENGTH SCORES ON PRE-TEST-EXPERIMENTAL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	3.60	1	3.60	—
B (Conditions)	0.10	1	0.10	—
C (Quantities)	11.48	3	3.83	—
D (Age Levels)	1412.09	4	353.02	20.40**
A × B	0.62	1	0.62	—
A × C	15.30	3	5.10	—
A × D	23.46	4	5.86	—
B × C	21.00	3	7.00	—
B × D	5.21	4	1.30	—
C × D	78.71	12	6.56	—
A × B × C	33.08	3	11.02	—
A × B × D	0.95	4	0.24	—
A × C × D	53.14	12	4.43	—
B × C × D	78.19	12	6.51	—
A × B × C × D	159.85	12	13.32	—
Within	1384.00	80	17.30	—
TSS	3280.78	169		

\*\*Significant at both levels

TABLE 25  
ANOVA OF MASS SCORES ON PRE-TEST-EXPERIMENTAL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	2.76	1	2.76	—
B (Conditions)	0.01	1	0.01	—
C (Quantities)	10.82	3	3.61	—
D (Age Levels)	5107.72	4	1276.93	54.61 **
A × B	2.25	1	2.25	—
A × C	141.67	3	47.22	2.01
A × D	189.83	4	47.46	2.02
B × C	78.02	3	26.01	1.11
B × D	5.71	4	1.43	—
C × D	161.48	12	13.42	—
A × B × C	90.67	3	30.22	1.29
A × B × D	0.59	4	0.15	—
A × C × D	216.87	12	18.07	—
B × C × D	220.89	12	18.41	—
A × B × C × D	118.11	12	9.84	—
Within	1870.50	80	23.38	
TSS	8217.50	159		

\*\*Significant at both levels

TABLE 26  
ANOVA OF WEIGHT SCORES ON PRE-TEST-EXPERIMENTAL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	3.60	1	3.60	0.01
B (Conditions)	0.23	1	0.23	0.008
C (Quantities)	58.88	3	19.63	0.75
D (Age Levels)	4427.78	4	1106.94	42.49 **
A × B	1.60	1	1.60	0.006
A × C	99.60	3	33.20	1.27
A × D	130.27	4	32.57	1.25
B × C	70.27	3	23.42	0.89
B × D	2.52	4	0.63	—
B × D	339.12	12	28.26	1.08
A × B × C	99.00	3	33.00	1.26
A × B × D	1.03	4	0.85	—
A × C × D	405.53	12	33.79	1.29
B × C × D	162.48	12	13.54	0.51
A × B × C × D	139.87	12	11.65	0.44
Within	1084.00	80	26.05	
TSS	8025.78	159		

\*\*Significant at both levels

TABLE 27  
ANOVA OF NUMBER SCORES ON PRE-TEST-EXPERIMENTAL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	85.56	1	85.56	2.31
B (Conditions)	0.31	1	0.31	—
C (Quantities)	172.47	3	57.49	1.55
D (Age Levels)	8368.56	4	2092.14	56.62 **
A × B	120.65	1	12.65	0.34
A × C	123.17	3	40.06	1.08
A × D	280.41	4	70.10	1.80
B × C	47.82	3	15.94	0.43
B × D	6.29	4	1.57	—
C × D	268.44	12	22.37	0.60
A × B × C	113.47	3	37.82	1.02
A × B × D	11.94	4	2.98	—
A × C × C	298.49	12	24.87	0.67
B × C × D	535.21	12	44.60	1.20
A × B × C × D	318.06	12	26.50	0.71
Within	2956.50	80	36.95	
TSS	13596.35	159		

\*\*Significant at both levels

TABLE 28  
ANOVA OF LENGTH SCORES ON POST-TEST EXPERIMENTAL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	4.56	1	4.56	—
B (Conditions)	0.06	1	0.06	—
C (Quantities)	8.72	3	2.90	—
D (Age Levels)	77.85	4	19.46	—
A × B	0.50	1	0.50	—
A × C	7.37	3	2.45	—
A × D	30.60	4	7.65	—
B × C	1.97	3	0.65	—
B × D	1.35	4	0.34	—
C × D	33.75	12	2.81	—
A × B × C	12.32	3	4.11	—
A × B × D	0.90	4	0.22	—
B × C × D	11.25	12	0.93	—
A × C × D	21.60	12	1.80	—
A × B × C × D	27.90	12	2.32	—
Within	265.50	80	33.19	
TSS	506.20	159		



## THOUGHT DEVELOPMENT IN CHILDREN

TABLE 29  
ANOVA OF MASS SCORES ON POST TEST-EXPERIMENTAL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	38.02	1	38.02	0.927
B (Conditions)	60.40	1	60.40	1.472 **
C (Quantities)	121.40	3	40.46	0.998
D (Age Levels)	8204.10	4	2051.02	50.012 **
A×B	1.22	1	1.22	—
A×C	131.68	3	43.89	1.070
A×D	159.85	4	39.96	0.773
B×C	160.10	3	53.36	1.301
B×D	130.85	4	32.71	0.797
C×D	152.60	12	12.17	—
A×B×C	11.88	3	3.96	—
A×B×D	25.16	4	6.29	—
A×C×D	296.95	12	24.74	—
B×C×D	446.15	12	37.18	—
A×B×C×D	373.74	12	31.14	—
Within	3281.00	80	41.01	—
TSS	13595.10	159		

\*\*Significant at both levels

TABLE 30  
ANOVA OF WEIGHT SCORES ON POST-TEST-EXPERIMENTAL GROUP

Source of Variation	SS	df	MSS	F
A (Sex)	6.01	1	6.01	—
B (Conditions)	26.41	1	26.41	—
C (Quantities)	85.29	3	28.41	—
D (Age Levels)	8031.44	4	2007.86	48.19 *
A×B	2.75	1	2.75	—
A×C	162.17	3	54.06	1.29
A×D	142.71	4	35.68	—
B×D	243.81	4	60.95	1.46
B×C	148.07	3	49.36	1.18
C×D	66.81	12	5.57	—
A×B×C	11.62	3	3.87	—
A×B×D	17.84	4	4.46	—
A×C×D	368.24	12	30.69	—
B×C×D	405.34	11	33.78	—
A×B×C×D	352.41	12	29.36	—
Within	3333.50	80	41.66	—
TSS	13404.35	159		

\*Significant at .05 level

TABLE 31  
ANOVA OF NUMBER SCORES ON POST-TEST-EXPERIMENTAL GROUP

<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MSS</i>	<i>F</i>
A (Sex)	316.41	1	316.41	5.26 *
B (Conditions)	61.26	1	61.26	1.02
C (Quantities)	437.02	3	145.67	2.42
D (Age Levels)	12006.63	4	3001.66	49.92 **
A × B	7.65	1	7.65	—
A × C	282.57	3	94.19	1.56
A × D	521.49	4	130.37	2.16
B × C	38.32	3	12.77	—
B × D	145.02	4	36.25	—
C × D	347.32	12	28.94	—
A × B × C	88.82	3	29.60	—
A × B × D	172.26	4	43.06	—
B × C × D	629.59	12	52.46	—
A × C × D	496.16	12	41.34	—
A × B × C × D	578.39	12	48.20	—
Within	4809.50	80	60.12	
TSS	20938.35	159		

\*\*Significant at both levels

\*Significant at .05 level

This improvement was not noticeable in the conservation performance of subjects on quantities Area and Volume, for which no training was provided.

On the basis of the results of this study let us examine the basic assumptions of Piaget with regard to cognitive development in children: Is learning subordinated to development? The subjects of this study seemed to have profited from training or learning. The significant differences in performance between pre-training and post-training test performance point to this. The subjects in the experimental group certainly profited from the training given to them. The subjects in the control group, however, did not show such marked improvement. Still, their improvement was observed with quantities like Length, Mass, Weight and Number for which training was given.

Thus, the effect of training in improving conservation performance was evident for the subjects who received training. The subjects' performance improved only on the quantities for which training was given. In contrast,

the performance of the control group did not improve, showing that conservation performance does improve with training. The subjects who were much younger, i.e. between 4-6 years, demonstrated that they could profit from training. Piaget and Inhelder, as we observed earlier, found that children could conserve weight at 8 or 9 years. Our subjects in the experimental group, who were no more than 6 years of age, could demonstrate conservation of weight. It could be that the children's understanding was limited. They could also have been responding superficially. Verification of this was however beyond the scope of the present study.

Only one other question remains yet to be examined. If the VRI technique was effective, how was it that the subjects did not improve in conservation performance on the quantities of area and volume? Perhaps this is not a pertinent question. For we have shown that no transfer effect was found. Therefore, lack of improvement in performance on conservation of area and volume should be explained as having been caused by non-provision of relevant training. Since the subjects received training in conservation of mass, weight and number, there was scope for improvement in performance concerning these quantities. On the other hand, the subjects did not receive any direct or indirect training with regard to conservation of area and volume. Naturally, there was no improvement in their performance on these quantities.

Our results largely corroborate Piaget's findings. However, there are significant deviations. The results demonstrate that the verbal training technique is superior to non-verbal training technique. Similarly, differences in conservation performance owing to differences in ability levels among the older children were found to be significant.

The important educational implications of the findings of this study are:

1. As there is no 'transfer' of conservation training from one type of quantity to another, it is suggested that with young children, conservation training, if given, should be on all the quantities.
2. The finding that children acquire conservation of different quantities fully at different age levels suggests the need for adapting our teaching methods to suit the level of our students.

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# Polytechnical Education (Agriculture) in G.D.R. : Its Relevance to Work Experience Programmes in India

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POLYTECHNICAL education in G.D.R. is a way of life for the citizens, since the initiation of the programme commences from the creche and continues through the 10th grade and onwards. The conditions for the implementation of the programmes, working conditions, human relationship and the disciplined approach facilitate the successful completion of the programmes. Some of the following points already existing in that country, may be considered here for the implementation of polytechnical education both in rural and urban areas in India.

- All the schools in G.D.R. uniformly possess facilities like furniture, classrooms, workshops, laboratories, libraries, teaching aids, trained teachers and provision for co-curricular and extra-curricular activities necessary for the programme.

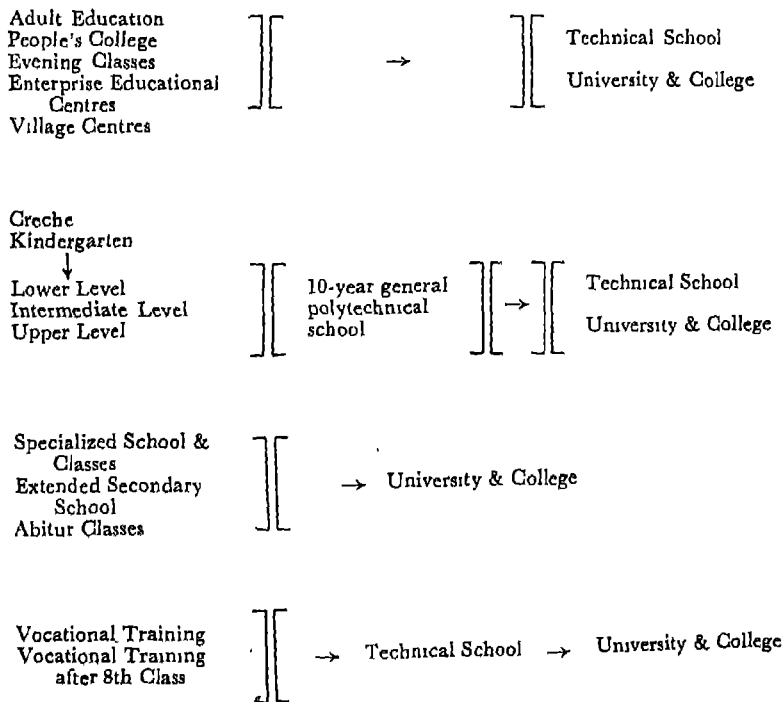
- Ten-year general polytechnical schooling for all.
- Education controlled by state and parents.
- Uniform pattern of education with common syllabi.
- Well prepared textbooks, reference materials, teachers' guides, students' guides, and visual aids developed and supplied by one central agency.
- Adequate scope for the pupil to get acquainted with the scientific and technological environment, as science and mathematics as disciplines are emphasized from the lowest class.
- Emphasis on all-round development of personality, enabling a citizen to participate in planning, management and joint ownership of the means of production
- Scientific approach to nature, life and society.
- Principle of systematic and planned approach to manpower and resources pertaining to the present and future needs of the society and state.
- Emphasis on the training and re-training of teachers.
- Particular care and attention being given to children coming from workers' or farmers' families.
- Advanced communication, system electrification, water supply, network of state and national highways, housing facilities, cheap boarding houses for pupils and teachers.
- Agricultural cooperatives and enterprises support the polytechnical education in every country.
- Cooperation between administrators, teachers, pupils, community.
- Active role of youth organizations for the benefit and upliftment of the community.
- Responsibility of the state to employ all the trained personnels.
- Adequate budget allocation for polytechnical education.
- Annual fairs and exhibitions by every school to publicize the pupils' achievements and learning outcomes for the benefit of the community.
- Competitions, project-work, youth activities, etc. for a healthy and purposeful education
- Adequate financial facilities for polytechnical students in grades IX and X, who can earn during vacation.
- Low pupil-teacher ratio (18.5).
- Small and compact group of pupils for laboratory, workshop and farm.

It is necessary that in the light of the above-mentioned facts such a climate can also be created in our country to implement the work-experience programmes. During my stay in G D.R. I observed that the love for plant

life is shared both by the young and old. Growing ornamental and foliar plants through hydroponics was a common feature at home, school, factory, hotels, recreational centres, hostels, public and private buildings. Hydroponics has become a part of their life, and every child from the age of 2-3 onwards has developed a taste for nurturing the plant life around him. Every home in G.D.R. is like a flourishing green-house or a horticultural nursery.

The following chart illustrates the Integrated Socialist Educational System.

### INTEGRATED SOCIALIST EDUCATIONAL SYSTEM



Interest in technology is inculcated in the pupil from the beginning. Scientific thinking is systematically developed. The foundations for education in technology are firmly laid. The simplest manual skills are designed to promote knowledge. Gardening is introduced in the first four years of school and for the age group 7 to 10 years.

A school garden is like a laboratory, where a student can learn about the principles of agriculture and horticulture. Pupils are given an opportunity to cultivate the soil according to the results of soil analysis. They sow and harvest the crops in a scientific manner. They sow the seeds and raise seedlings in nursery beds. They observe the stages of germination and the growth of plants. They compare the different varieties of crops, and calculate yields on the basis of application of different fertilizers. The joy and pride of the outcome of their efforts is shared by the teacher and the pupil.

All gardening activities are carried out keeping in view the age, and the physical and mental development of the child. Almost every school has a garden with plots and sub-plots and a permanent fencing or hedge around it. Training in the crafts is imparted in all the schools. Hand tools of all sizes are made available to the students. Neat store-rooms, and workshops for simple repairs are attached to every school.

A Central School Garden Area is provided to students who attend schools which do not have their own gardens. Here, students from such schools gather for practical work. In the town of Erfurt I visited a central garden which caters to 17 schools in the city. Over 5,000 pupils come here for gardening. Each school has a separate plot. Name boards and batch boards are fixed for every school. I saw all the required tools of different sizes and a small workshop for minor repairs. Store-rooms for storing seeds, plant protection materials, fertilizers etc. are also on the garden compound. Each school sends its students in batches. The time table is planned in consultation with the teachers of the central school garden. Small glass-houses are also made available to raise plants when the weather outdoors is unfavourable.

There is regular grading and assessment of the pupils, both by the central school garden staff and the agriculture teacher of the school.

A special tram service at a very cheap rate is operated to take pupils to the school garden area. Though the time allotted for gardening was not much, I could see that the pupils were working systematically and making the most of it. Healthy competition is also promoted among the students.

In the schools which have attached gardens, the produce of the garden is used for lunch served to the students, and the revenue so realized supplements the funds for the school's agriculture section.



The budget for garden work is provided by the state. A teacher of agriculture, in consultation with headmaster, prepares the annual budget on the basis of the number of students. He gets the amount he asks for without any difficulty. This is one of the factors which contribute to the success of gardening programmes in G.D.R. I found that growing potted plants and hydroponics were practised a good deal in every school, and even in shops and factories. Foliar and flowering plants are grown in every house. Flowers and plants seem to be a part of the life of a G.D.R. citizen.

There is a systematic evaluation of pupils' work right from the primary stage. Individual record books and grade cards are maintained. I found a spirit of keen competition and high motivation in the pupils. The very appearance and environment of a classroom and a laboratory infuse in the pupils the urge for learning.

In classes 7 and 8, the pupils go through polytechnical instruction once a week in a socialist factory or agricultural cooperative. In classes 9 and 10, the pupils gain regular admission in the state agricultural enterprises and other cooperatives. Here, they acquire fundamental technical and economical knowledge and skills. They become familiar with the social relationship existing within a state enterprise and the features of its operation, such as the participation of workers in decision-making or the part played by trade unions. Instruction and training for the pupils in classes 9 and 10 is provided by specially trained supervisors or factory foremen. The pupils attend three periods of practical work per week. The supervisors assess the pupils' progress from time to time and inform the polytechnical centre at the end of the term. During this period of training, the pupils are provided with special instructional rooms, teaching aids and other facilities.

From the 9th grade onwards the following five broad fields are offered to the pupil for polytechnical training in agriculture:

- (i) Production tasks and aims of agricultural enterprise.
- (ii) Fundamentals of plant growth.
- (iii) Animal science.
- (iv) Mechanization, enhancement of production, repairs and maintenance of machines.
- (v) Economics of production, record keeping, planning, accounting, labour organizations, loans, etc.

Therefore, polytechnical education is not a mere acquisition of technical skills. It makes clear the relation between technology and the natural sciences, and how scientific knowledge can be used for man's benefit.

### Conclusions

Work experience can be introduced and a healthy trend in education will follow if some of the following points are considered for immediate implementation.

- Training of teachers associated with work experience programmes.
- Development of curricula and instructional materials, keeping in view the local needs and the local environment.
- Propaganda through different sources to inform the public of the importance of work experience in our agrarian set-up.
- Introduction of 'home projects' in classes 9 and 10, so that the application of knowledge and skills acquired at school extends far beyond its boundaries.
- From class 9 onwards, students in villages should be given work experience in farms where modern cultivation methods are used. In urban areas, the pupils should get the chance to participate in a real production situation in factories.
- Setting up of model work experience cells at the taluk level.
- Honouring teachers who have designed successful work experience programmes.

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# The Release of Creative Potential

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A simple, yet difficult, question often arises in the mind of a thinker. What are we meant for? Why do we live at all? The head of a totalitarian state would immediately reply: You are meant for consolidating the state in peace and for cannon-fodder in war. An energy-consuming society in the West would find satisfaction in consuming more and more irreplaceable material at a greater and greater rate, going deeper and deeper into the debt of nature. A Nirvan-seeker in the East may find the answer in ending this miserable cycle of birth, death and re-birth. But most of the people concerned about human decency and liberty believe that man is here to realize or actualize, as much as possible, his potentials within the framework of a stable and yet elastic society. This aim is neither too mystic nor too mundane. Creativity is the entelechy of life and one realizes his potential only through creativity. This fundamental concept, which underlies all the democratic views of life, is a convenient proposition of feeling and faith, rather than of reason. In fact, this concept is axiomatic with most of educational theory and practice.

We have just referred to a 'stable and yet elastic society' In this context, let us consider the relationship between individuals and the culture in which

they happen to live. One viewpoint can be that the culture is a machine which makes it possible for human beings to develop their potentials. Evidently this is true, for no Robinson Crusoe, no matter how highly gifted, can develop his latent potentialities to the fullest outside an 'organized culture'. Some sort of cultural alienation is essential for the release of creative potential, but not to the extent of becoming a wolf-boy of Itard or bear-girl of Zynge. This paradox is inevitable, for culture is not only a machine which helps us actualize our potential, but also a machine which prevents us from actualizing them. We are the beneficiaries as well as the victims of our culture. We are prisoners of our culture, and we try to jump over its walls. It is only by transcending the bounds of a culture at any given moment that an advance can be made. To plan a society, which should be stable enough to provide for its members physiological and psychological succour and at the same time elastic enough not to mind the overleaps of its individuals, is a constant challenge to social scientists. If we look back, we find that such overleaps have often been made but mostly at the cost of the overleaper. We all know what happened to Socrates, to Jesus, to Dayananda and to Gandhi.

Now we come to consider. What can we do in the culture we live in at present? There are a number of factors controlling human existence. To release the creative potential (lying dormant like a serpent, the Kundalini), we must attack all the fronts simultaneously—the front of heredity, the front of physiology, the front of education, the front of meditation, the front of certain psychotherapies. The process of over simplification, i.e. the process of thinking in terms of a single cause, may be described as the original sin of the intellect. It does not matter whether this sin is committed by Marx or Freud, Adler or McDougall, Adam or Eve. We have to make our multipronged attack on all the fronts at one and the same time. Let's consider them one by one.

With regard to the heredity factors, selective breeding could be employed to improve the human stock. But at present, we do not know much about human genetics to execute such a policy. Moreover, public opinion in our culture shall remain strongly antagonistic to such a policy for decades to come. In the meantime we shall have to deal with individual differences. Though anthropologist Strauss tells us that individual differences are the greatest myth of the social sciences, and that people have been born equal in intelligence for nearly the last million years, and that the havoc of individual differences is caused by unequal environment and by the tools of psychological measurement, yet individual differences are a reality to be reckoned with. In a totalitarian society there is often a conscious effort to

iron people out into a kind of uniformity. Fortunately, our society permits a good deal of latitude. It is desirable to polish the pebbles, but without dimming the diamonds. We should provide equal opportunity of development to all citizens: at the same time we should not force anyone to adopt a form of existence which does not suit him. We shall have to develop methods of differential education for people at the extreme limits of physical, temperamental and intellectual variabilities.

Now we shall consider the physiological aspect of the problem. What can we do, on the physical level to help people realize their potentials? This is basically a question of nutrition. The caloric intake of the poor in India is meagre, and is mostly derived from starch and carbohydrates. The rich take in more calories, mostly derived from fat. Very few people are conscious of the concept of a balanced diet and still fewer are able to take a protein and vitamin-rich diet. The incidence of coronary thrombosis among the rich is ten times as much as that among the poor. Diseases due to malnourishment are most prevalent among the poor. We cannot imagine a healthy creative mind in an ailing body. Therefore, a lot is to be done on the nutrition front. Closely related to it is the question of psycho-pharmacological methods of changing the mind. Again, we do not know much about this front as yet. The psycho-pharmacologists are busy in fulfilling two positive aims and one negative aim. The two positive aims are the improvement of intelligence and the deepening and the extension of the feeling of friendliness and love. The negative aim is to cut down on the potentialities for violence and aggression. Only the future brave new world may know the application of these drugs for these purposes. Much more ticklish will be the problem on whom will these drugs be administered, on the select few or on the masses?

Let us now come to the educational problems which are most interesting and are of the widest applicability. Education for the most part exists on the verbal level. Out of the nine celebrated arts in the middle ages in Europe, seven were purely verbal and the remaining two involved something non-verbal: they were the art of astronomy and the art of music. To this day, although there has been considerable modification, most of our education is essentially on the verbal plane. Should we not teach our children the limitations in the nature of language and the art of differentiating education from propaganda? Education lays emphasis on how to think, whereas propaganda lays emphasis on what to think. The latter can be immensely powerful in eliciting the most undesirable potentialities in men. Hitler had a formula for propaganda. He said specifically, "You must confine yourself to very, very simple slogans—very few and simple slogans;

you must never admit the other side could possibly be right; you must never admit there are any gradations; things are either black or white, very good or very evil, and you must repeat incessantly." When we free a young mind from the pernicious influence of propaganda, it gets partly deconditioned and therefore becomes more original and creative. With the help of linguistic analysis which has made remarkable advances in the 20th century, we can teach our children and later adults to distinguish between propaganda aimed at creating conditioned reflexes and education aimed at offering the materials on which a rational choice could be made. There is profound difference between the two.

We must think of education on the non-verbal level also. There is no dichotomy between mind and body. Functionally the mind-body is a single entity which has to do the learning and the living. In our present day education, we concentrate on the mind only and that too on the verbal plane. Therefore, we do not do much for the strange, multiple amphibian organism which we possess. Spinoza says, "Teach the body to do many things, this will help you to perfect the mind and to come to the intellectual love of God". It is a remarkable phrase and can become the motto of creative education if we substitute for the word body, the word organism, and for the word 'mind' the word 'mind-body'. Mahatma Gandhi could think of this lofty ideal when he gave out his scheme of basic education to the nation. He kept the craft at the centre and wove the entire body of knowledge around it. He wanted to draw the best out of the child's body, mind and spirit through physical labour. The present 10+2+3 scheme as put forth by the Indian Education Commission (1966) keeps work experience as merely one of the several experiences and that too not at the centre around which other experiences should grow. It is all the more important in this age of advancing technology and should be done deliberately. If we look at some of the very very primitive instruments and tools made by our ancestors, we can realise the enormous skill in producing those objects of wood and stone. But we have today exactly the *contrary*. We have extremely complicated tools to make not only complicated things but also very simple things. We have fool-proof machines but we must remember that they are also spontaneity proof, inspiration proof and creativity proof. Along with the mind-body training, we have to train our mechanism of perception because ultimately all our thoughts, feelings and will are based upon perception. Don't we train only our auditory perception and to some extent our visual perception at the cost of the other three?

From this let us pass on to meditation and religion. 'Know thyself' is a very old exhortation. But only our ancient seers could chalk out a well-planned programme of knowing the self through the various paths of

Hathayoga, Karmayoga, Jnanyoga, Bhaktiyoga, Mantrayoga etc. The culmination of these yogas is in the state of meditation which transcends the level where we are all conditioned to the ephemerality. We get deconditioned in meditation and are possessed by the Divine which sometimes sends forth the 'peak experiences' (Maslow) or 'the moments of illumination' (Paul Brunton). During such experiences, one is simply surprised with joy, courage, love and other positive qualities essential for creative expression. Some training in meditation does improve our consciousness, intelligence and creativity and widens the horizon of personality with the inculcation of love, friendliness and removal of anxiety syndrome. Hundreds of studies conducted in America and Europe under the inspiration of Maharishi Mahesh Yogi stand testimony to the above statement; almost all the great religions of the world aim at inculcating the spirit of love, compassion and friendliness in their followers. What is Christian heart and charity is the Anatmavada of Buddhism and the Atmavada of Upanishadas. If Christianity declares fatherhood of God and therefore brotherhood of mankind, Buddhism pleads for dissolution of the empirical self, and Hinduism exhorts us to widen the horizons of self so as to cover up the entire circumference of life and existence. But unfortunately these lofty ideals could never be picked up by the masses as no palatable technique was suggested. The only people who have set out deliberately to create in their children a prejudice in favour of love and friendliness are the Arawak in New Guinea, a very primitive tribe described by Margaret Mead. They create such a social milieu that their children cannot help but develop love and friendliness. Then we have to deal with that terrible monster, racial and religious prejudice. Gordon W. Allport studied this problem in India and other countries quite deeply. What he could suggest was the technique of individual psychotherapy to remove prejudice from the mind but evidently that cumbersome and time-consuming method cannot be applied on a mass scale. Therefore, the problem of mass-aggression and violence remains untackled. William James in his essay 'The Moral Equivalent of War', suggests the method of channelizing along peaceful lines the desire for heroic action which gives a feeling that a person is working for a cause greater than himself. For this, he even suggested some kind of conscription for creative social work. Though not a panacea for controlling aggression, this technique suggests the line of action which might be pursued.

Lastly we come to the gamut of various psychotherapies like psychoanalysis, individual psychology, analytical psychology, existentialist therapy, hypnotherapy, bibliotherapy, occupational therapy, play therapy, behaviour therapy etc. which aim at realising the creative potential, but no one

has seriously studied the psychotherapeutic effects of various types of classical and folk dances like coribatic dances of the Greeks, Bhangra, Kathakali and Bharat Natyam of India. Also the effect of Ragas and Raginis from classical Indian music upon various emotions needs a thorough scientific study. These dances and songs cope with the irrational, and this is one of the great uses of reason

In addition to the above-mentioned few areas, there is an immense amount of material lying around, the material created by the forgotten cultures, the material created by the individuals in the hoary past. There may be a grain of truth in the people whom we regard as charlatans. After all, truth lives at the bottom of the well and the water may be extremely muddy. But we should be cowards not to go to the bottom of the self. The seers of the Isa Upanishad say, "The truth is covered with a gold lid, kindly lift it to enable us to see the truth below." Truth is truth, may it be below the mud or the gold lid. There may be many very non-academic places where empirical things have been found. If a team of devoted research workers can look into all the scattered techniques of realising desirable human potentialities, look into their desirability and practicability, then these principles could be applied in general education from nursery to post-graduation. They would improve the system a great deal for the realisation of intellectual potentials, inculcation of love and release of creativity. □



# BOOK REVIEWS

## *Psychological Foundations of Education*

Dandekar, W.N., The Macmillan Co. of India Limited, New Delhi, 1971, pp. X+453  
Rs. 25.00

THE intent of the book is "to help the reader to think and interpret the various principles and concepts in the light of the classroom situations" (Preface). To achieve this aim the author has incorporated sections on educational implications in most of the chapters, but these sections generally contain certain instructions and suggestions to the teacher, most of which do not directly follow either from the content, discussed in the chapter, or from well-established research findings in educational psychology.

As regards the content, "the main theme running through the chapters is the growing child" (Preface). From this one would expect emphasis on the developmental approach in most of the chapters. But this is hardly the case. Again, the author's claim that "the discussion has been made up-to-date" in the book is hardly justified, as the book draws its material exclusively from foreign textbooks which are not up-to-date. The author has passed over many relevant and current research investigations in the field.

Coming to specific points, one finds numerous instances of lack of precision, and there are inaccuracies in definitions of terms and concepts. For example, the function of clinical psychologists is said to be "to improve the youngsters' emotional and social adjustment" (p.2). This is an incorrect statement because it fails to indicate the most important functions of the clinical psychologist, viz. psychodiagnosis, individual and group therapy in mental illnesses of adults and children. Again, it is wrong to say that animal

psychology "studies the behaviour of the animal under experimental conditions" (p. 18), since animal behaviour under natural conditions occupies an important place in this branch of knowledge. Most of the definitions of the branches of psychology suffer from the same defect.

The author rightly states, "The central theme of the Educational Psychology is psychology of learning . ." (p. 22). However, he devotes just about 30 pages for this important area, describing only the old and outmoded theories of learning, like connectionism and older versions of Gestalt, Pavlovian and Skinnerian view points. The recent advances in fundamental and applied aspects of learning-theories, which have revolutionized educational psychology, find no place in the book. And therein lies the most serious limitation of this book. The other topics have also been dealt with in a traditional way. Recent view points and research findings, as well as Indian studies, have been completely left out of the purview of this book. Although the author attempts to depict the Indian school situation by mentioning Indian names for his illustrations, he has meticulously avoided any reference to relevant Indian studies or psychological tests developed in India.

On the credit side, the book has been written in a simple and lucid style throughout, and there is no ambiguity or circumlocution, but this would hardly compensate for the serious shortcomings it suffers from.

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*Girls' Education and Social Change*

Desai, Chitra; Bombay, Ahmedabad, A R. Sheth & Co., Aug. 1976, Rs. 30, pp 293

MANKIND is perhaps about a million years old. So also is womankind. But as nature would have it, or as the historical records would show, for a greater part of these million years men have, on the whole, been dominating, dictatorial and even fairly unkind to their womenfolk. A really great period of subjection for the 'Eve'. Even today, they are being treated in the same old way almost all over the world. The etymology of the word 'woman' is perhaps at the base of such an attitude. Since times immemorial, woman's very right to social existence has been considered in terms of her secondary role to man. This is perhaps because of the fact that the word woman was conceived in its original form as "wif-man", i.e. wife of the man, which subsequently changed to 'wimen' and then to 'woman'.

Thus, as a natural process, the formation of unique womanly qualities begins with the little girl in her childhood. The process continues throughout childhood, puberty and adolescence. As a result, a firm identity as a prospective wife and mother is established usually by the time she comes of age. And this family image is probably an inherent, built-in and unconscious characteristic of a woman—a product of the patterned psycho-sexual development in a woman's life. According to Freud, women are almost lost to education and psycho-analysis when they are in love. And this is particularly so during adolescence when it is difficult to educate them. At times they refuse to learn. An additional dimension worth notice is that perhaps most of the girls, no matter which country they belong to, go for education to better their prospects of marriage and, as such, their educational interests may be more of a hobby than any desire for learning.

Educated women in our country, and for that matter in any other developed or developing country, are not an exclusive and elitist group. There is no gainsaying the fact that the first teachers of children are women in their potential role as mothers. Precisely for this reason alone women should be educated, so as to enable them to properly bring up the younger generation for effecting desirable social changes. It is often said that Shakespeare had no heroes—he had only heroines, because the tragedy in almost all his plays is caused always by a tragic flaw in a man. It seems, to Shakespeare, woman's intuition is a kind of 'sixth sense', an ability to 'listen in the dark'. Woman's intuition, over man's reason, is a valuable trait

which gives her greater advantage to make the best use of her education. The result is that almost everywhere women are achieving honoured positions once considered beyond their capacity. They are now replacing men in most of the occupations which were once the exclusive preserve of men. The International Women's Year helped the women elite to raise the image and aspirations of the common women who are now seen coming forward in greater numbers and with greater awareness to join colleges and universities, taking up various trades and professions traditionally reserved for men only.

In this context of social change all over the world, the book under review is a timely addition to the limited literature on women's education in our country. This doctoral research work from Bombay University analyses social change in its various aspects, particularly in relation to the progress and problems of girls' education at school in the State of Gujarat.

The researcher holds that the "outstanding dimensions of social change which have helped the cause of girls' school education are the adoption of national outlook in religion, particularly among the university educated young men and women, the increasing trend in the higher age of marriage for both boys and girls, the increasing tendency among the educated to choose educated life-partners, the spread of radical thoughts, the broadening of social outlook, the changing social perceptions and attitudes towards females and their needs and problems, the impact of the Indian Constitution which upholds the principle of social equity and social justice, the acceleration of the process of democratisation, the increasing economic pressures on families which compel them to send the educated wife, sister and daughter to supplement the family's income by doing remunerative work in offices, industries and other professional occupations. The processes of modernization, industrialization, urbanization, coupled with planned scientific and technological advancement in various spheres of life have gone a long way in effecting a sort of positive social change among women-folk, especially in relation to their attitudes towards caste-system and social hierarchy, religious and social beliefs, the joint family system and women's role at home, marriage and other socio-cultural factors".

Field studies conducted by the research worker identified certain vital factors favourable to girls' school education as also the unfavourable ones. Nonetheless, with the passage of time, particularly during the post-independence period, the Gujarati society has considerably moved forward to make education accessible to girls. But it has "miles to go", observes the investigator. "It needs determined, imaginative and humanistic leadership both from the society and from Government to give the movement of female education a kind of focus, momentum and direction. A separate infra-

structure for the planning and administration of female education, with its own budgetary allocations in the State's educational budget and the adoption of social objectives in regard to promotion policy in the schools and such other focal points might help in improving and enriching girls' access to school education. . . . Unless the centre plays a larger role than what it has been doing so far in female school education, the problem of female illiteracy, high incidence of wastage among girls, a large number of girls of school-going age remaining outside the school, inadequate development of woman-power, and consequently inadequate production of wealth would unfortunately continue. . . . Social change in the country can be a CAUSE as well as the RESULT of greater spread of girls' education." Obviously, the study seeks to provide a sort of direction or guideline for the policy-makers, at the state and national levels, in the task of improving girls' education in the country.

Yet there are certain obvious limitations of the study. While the major objective of the research was to identify factors that promote or hinder girls' school education in the context of changing circumstances, the researcher has not consulted or interviewed any school-going girls or dropouts. They could have told the author about their problems related to their education and to their perception of social change. One wonders why the investigator avoided this and preferred to be satisfied with responses from parents, educational organizers and administrators at school level. Besides, the study seems to be unduly loaded with the history of girls' education in the state—from the ancient to the present. As a result, most of the findings seem to be based on theoretical evidence rather than the empirical one. The empirical case studies included therein form a negligible part of the book. The investigator has not included any discussion of the curriculum which often plays an important part in changing the cultural milieu.

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